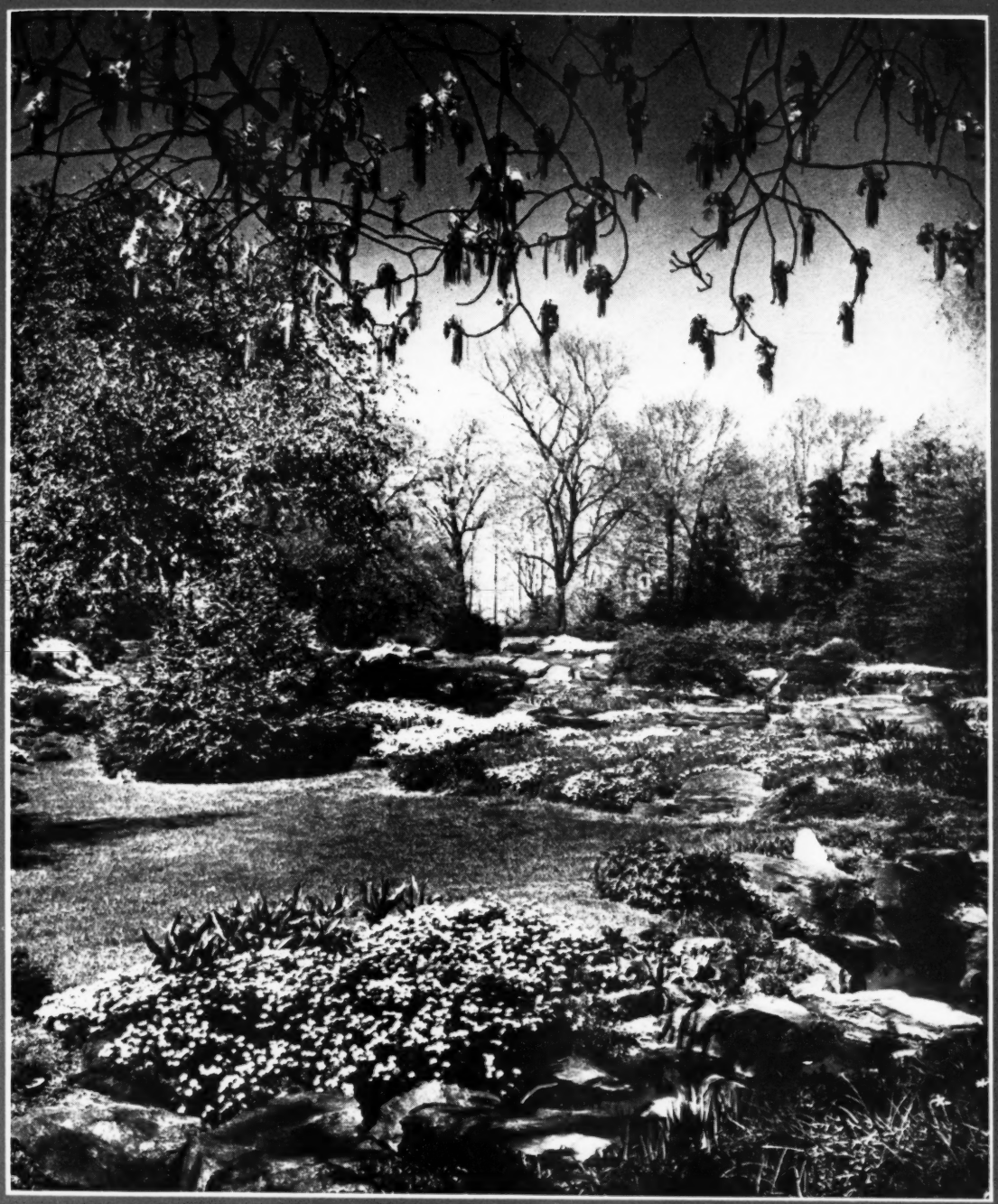

THE GARDEN JOURNAL

THE NEW YORK BOTANICAL GARDEN

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THE GARDEN JOURNAL

THE NEW YORK BOTANICAL GARDEN

DOROTHY EBEL HANSELL
Editor

CALENDAR

March 25-September 25, 1960, hours 9 a.m.-12 p.m., Floriade 1960, Rotterdam, Holland. See Page 52 this issue.

April 5-7, 1960. Landscape School, 9th District, Federated Garden Clubs of New York State, Inc., at The New York Botanical Garden.

April 8, 1960. Easter Show in the Conservatory opens to members of The New York Botanical Garden. It will continue through April 24.

April 26, 1960, 2-8 p.m., April 27, 1960, 10 a.m.-5 p.m. Fifth Annual Connecticut Daffodil Show of the American Daffodil Society at Ekman Center, Electrolux Auditorium, Old Greenwich, Connecticut. Amateur and professional gardeners from in or out of the State may enter; schedules may be obtained from Mrs. Carl N. B. Dixon, Armstrong Lane, Riverside, Connecticut.

May 3 and May 10, 1960. City Garden Clubs — annual showing of beautiful gardens in the City of New York.

May 5 and May 24, 1960. Open Garden Days at The New York Botanical Garden.

May 12, 1960. Spring Garden Tour to Princeton, New Jersey, sponsored by the Volunteer Associates of The New York Botanical Garden.

May 16, 1960. Annual Meeting of The New York Botanical Garden at the Garden.

CONTENTS

March - April, 1960

TULIPOMANIA AND THE BENEVOLENT VIRUS — *René J. Dubos* — 41

PLANT COLLECTING IN THE LAND OF BALBOA — *William L. Stern* — 44

THE VOID IN AMERICAN HORTICULTURAL EDUCATION AND HOW TO FILL IT — *Donald P. Watson* — 50

PLANS ARE REVEALED FOR U.S. EXHIBIT AT THE FLORIADE — 52

THE ECOLOGY OF INVASIONS BY ANIMALS AND PLANTS— A REVIEW — *Jack McCormick* — 54

TALL PLANTS FOR THE HERB GARDEN — *Helen M. Fox* — 55

QUALITY LAWN SEED — *Robert W. Schery* — 59

VIZCAYA—AN ITALIAN PALAZZO IN MIAMI — *Howard W. Swift* — 61

MEILLAND ROSE ESTABLISHMENT — *Alice Dustan Kollar* — 65

A "FOSSIL" LETTER FROM T. D. A. COCKERELL TO P. A. RYDBERG — *Herman F. Becker* — 68

WHERE THE AIS CAME FROM — 70

A COUNTRY HOUSEWIFE'S GARDEN — *Gertrude B. Foster* — 72

BOOK REVIEWS — 73

NEWS, NOTES, AND COMMENTS — 77

CREDIT FOR ILLUSTRATIONS

We are indebted to the Display Committee, Mrs. Charles Burlingham, Mrs. Richard S. Meredith, Mrs. Donald B. Straus, for the selection of the front cover illustration—the Thompson Memorial Rock Garden at The New York Botanical Garden, photo by Gottscho-Schleisner; pp. 42, 43, Charles C. Clare, Jr.; pp. 44-47, Dr. L. K. Chambers; p. 48, upper Otis Imboden; p. 50, Oeschberg Horticultural School, Koppinger, Switzerland; p. 51, Dr. Donald P. Watson; pp. 52, 53, American Horticultural Council—Edward Gottlieb Associates; p. 54, woodcut, Anita Clare; p. 55, Gottscho-Schleisner; p. 56, upper left, Walter B. Wilder, upper right, Gottscho-Schleisner; p. 57, upper left Gottscho-Schleisner; p. 58, Walter B. Wilder; p. 60 Oregon Fine Fescue Commission; p. 60, upper, Oregon Fine Fescue Commission, lower, Lawn Institute; pp. 61-64, Howard W. Swift; pp. 65, 66, Alice Dustan Kollar; p. 67, E. N. Mitchell.

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TULIPOMANIA AND THE BENEVOLENT VIRUS

By **René J. Dubos**

The following paper was presented by Dr. Dubos at the Symposium on Perspectives in Virology, New York, N. Y., February 1958. Dr. Dubos is a member of the Rockefeller Institute, which he joined in 1927, the year he received his doctorate from Rutgers University. He has had a distinguished career in all phases of bacteriology, immunology, and public health, and is specially interested in tuberculosis and disease resistance. Many honors have been conferred upon Dr. Dubos, including five Doctor of Science and one Doctor of Materia Medica degrees, and the Albert Lasker and the Trudeau awards.

THE EXISTENCE of viruses was first recognized through their ability to cause disease in man, animals, or plants —a historical accident which has conditioned all subsequent research on the effects exerted by viral infections. A few years ago, when virologists met in New York to compare notes on a group of new viruses for which no role was known in nature, the expression "Viruses in Search of a Disease" emerged naturally among them to describe the topic of the meeting. It was obviously taken for granted by all the participants in the meeting that production of disease was the earmark of a true virus. Failing the discovery of a bona fide disease in an animal or a plant, virologists try to satisfy their conviction that the raison d'être of a virus is to cause trouble by eliciting some sort of cytopathogenic effect in a tissue culture model—even, if need be, with a type of cell that the virus never has a chance to invade or even to encounter in nature. Not being a virologist, I can afford to take a more optimistic view of the problem and to entertain the fantasy that at least some viruses are now and then helpful rather than destructive to their hosts. Today, I should like to consider with you the possibility that there are circumstances in which the over-all effects of viral infection are beneficial to the community and even to the infected host.

I shall build my discussion around the history of the tulipomania, a social disorder which reached its acute phase in The Netherlands and in Flanders during the early part of the seventeenth century. As some of you may not be familiar with this peculiar mania, allow me to tell you something of its origin and manifestations.

The tulip has long been cultivated in Turkey but was unknown in Europe until the sixteenth century. It seems that the earliest European report of its existence came from Ogier Ghislin de Busbecq, who was ambassador of Ferdinand I of Austria to the court of Suleiman the Great. Busbecq saw fields of tulips in bloom for the first time while on a trip from Adrianople to Constantinople in January 1555, and he was so much impressed by the flower that he immediately arranged to procure seeds and bulbs for several of his European friends. The following April, Heinrich Herwart's garden in Augsburg was adorned with brilliant scarlet blooms. One of the first large plantations of tulips was that of Rye of Mechlen, started from Turkish bulbs around 1562. Rapidly the tulip caught the fancy of Europeans. In Holland and in Flanders its cultivation became almost a craze as well as a large matter of trade. Commercial growers and wealthy citizens competed for the production of new types of flowers characterized by attractive or unusual shapes, colors, or patterns of pigmentation. The production of a black tulip, for example, was a much desired achievement. The rivalries and tales to which it gave rise eventually found their way into Alexandre Dumas' novel, *La Tulipe Noire*.

Holland was at that time enjoying the most prosperous era of its history. An immense quantity of gold and silver was being introduced into the country by the Dutch buccaneers, who raided the Spanish and Portuguese ships homeward bound with the precious metals from the West Indies. As a form of economic war against Spain the Dutch government adopted a policy of "free" coinage, with the result that money was extremely abundant in The Netherlands. A general rise in local prices ensued which encouraged speculation among the Dutch people. The tulip with its many varieties seemed to provide good speculative material; the fact that many bulbs could be produced from a single specimen led speculators to believe that unbounded wealth could be realized by propagating the more expensive flowers. After all, this was not sillier than other forms of gambling in a non-existent commodity!

One of the earliest famous transactions was for one bulb of 'Semper Augustus', a crimson and white "flamed" tulip that was bought for thirteen thousand florins in 1609. Interest in the flower continued to grow, and in Paris around 1630 it became the rage among fashionable ladies to wear tulip blooms as corsages. The tulipomania—this most attractive boom of history—finally reached its peak in Holland between 1634 and 1637.

During the tulipomania the price of a single bulb of 'Semper Augustus' went as high as fifty-five hundred guilders. The following goods were exchanged for one bulb of 'Viceroy' tulip: four tons of wheat, eight tons of rye, four fat oxen, eight fat pigs, twelve fat sheep, two hogsheads of wine, four barrels of beer, two barrels of butter, one thousand pounds of cheese, one bed with accessories, one full dress suit, and one silver goblet. History reports that profitable mills and inns were exchanged in Flanders for a single specimen, and that a young woman became a very desirable bride when a famous bulb was made the single item of her dowry.

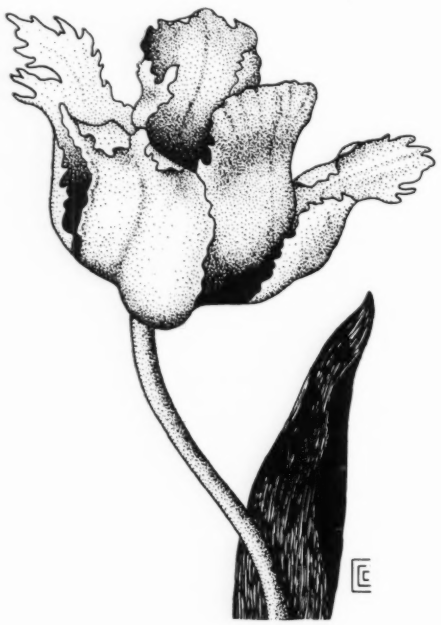
By 1637, the gambling had become so wild that the Government of the Federated States of Holland and West Frisia undertook to discourage it by ordinances rendering more difficult the enforcing of time-bargains in tulips. In 1648 moreover, the Dutch Republic discontinued "free" coinage when the Peace of Westphalia acknowledged its independence. This stopped the rise in prices and put an end to the acute febrile period of the tulipomania.[1]

1. A detailed account of tulipomania will be found in an herbal written by Abraham Muntingh, Professor of Botany and Medicine at the University of Groningen, Holland, and published in Amsterdam in 1672.

Some of the types of tulips that achieved greatest fame in history are well known from the handsome illustrations in Dutch, French, and English books of the seventeenth, eighteenth, and nineteenth centuries, as well as from paintings of the time. The younger Brueghel ("Velvet" Brueghel) was one of the foremost tulip masters and has immortalized many types of flowers in a host of pictures. Other painters also have left portraits of tulips worthy of note — for example, that painted in 1619 by Ambrosius Bosschaert and now in the Rijksmuseum in Amsterdam. The Rembrandt and Zomerschoon tulips are among the famous ancient tulips that are still cultivated today.

In addition to elegance of form and beauty of color, many of the famous tulips were characterized by distinctive patterns of pigment. These variegated forms were first carefully observed by the botanist Charles de l'Écluse of Arras, who cultivated tulips in his gardens in Vienna and in Flanders. Beginning in 1575 he described his findings in a series of accounts that were finally summarized in his book, *Rariorum Plantarum Historia*, published in 1601. Charles de l'Écluse's book, as well as many others published subsequently by Dutch, English, and French gardenists, are illustrated by handsome pictures which leave no doubt that the highest prices during the tulipomania were obtained for variegated plants. Until very recently, indeed, non-variegated flowers were rarely illustrated in books, because they were regarded as inferior and non-differentiated forms. Only during the past few years and after the development of the handsome Darwins have non-variegated flowers come to be preferred to the others because of their greater vigor and uniformity, especially for mass planting.

It was soon recognized that tulips raised from seeds do not produce variegated flowers at first. These plants (called breeders) have petals of uniform color—they are self-colored, as the expression goes—and their bulbs may continue to produce self-colored flowers for several years. Then after an unpredictable period of time there occurs a phenomenon referred to as "breaking" which results in variegation. From then on the bulbs of "broken" tulips continue to produce variegated flowers. According to van Slogteren and Ouboter[2] (1941), Dutch growers knew as early as 1637 that breaking could be produced at will by grafting self-colored tulips with variegated ones; Blagrave in England described in 1675 detailed techniques for grafting halves of bulbs to this end. It was also believed that breaking could be hastened by planting bulbs in poor soil or even



better by alternating cultivation in good and bad soil. But despite much practical knowledge, tulip breaking had remained an art and the mystery attending the phenomenon probably contributed to the captivating charm of the plant.[3]

In 1928 tulip breaking passed from horticultural lore into virus science when Cayley[4] in England and McKay[5] in America demonstrated that the change in the flowers was in reality the result of a viral infection of the mosaic type. Under natural conditions the virus is transmitted by aphids, but infection can also be achieved by experimental procedures, either by injection of plant juices or by grafting. Let it be mentioned in passing that the virus is widely distributed in wild lilies and in other plants; the tiger lily has been likened to "Typhoid Mary" in this regard. In consequence, a self-colored tulip has little chance of escaping infection in the field, even though it never comes into contact with a broken tulip. Breaking is likely to occur even when tulips are planted near apparently normal lilies, for healthy plants can carry the virus in a non-apparent form.

The viral infection can affect the color of the petals and also the leaves. Nor is breaking limited to tulip varieties containing anthocyanin pigments; it can also occur in clear whites or yellows which show then little or no change in color. The most striking manifestations of breaking, however, are changes in the distribution of anthocyanins in the epidermis of the petals, which become splashed or striped with different colors. It is held by McWhorter (1938)[6] that two antagonistic viruses are involved in tulip breaking. According to this author, one virus interferes with normal anthocyanin production and also causes a leaf mottle, whereas the other interferes with the floral color and has no effect on the leaves. Van Slogteren and Ouboter (1941)[7] believe, however, that one virus and differences in host response can account for the various manifestations of breaking.

Breaking of tulips is, therefore, now considered as the result of infection by a virus or by a combination of several viruses. In fact, the seventeenth century horticulturists and their followers had realized that all was not well with some of their most attractive broken specimens. They had observed that broken tulips were likely to be less vigorous than the self-colored plants and to produce fewer bulbs. In a number of cases indeed, death of broken tulips occurred after a few generations. It is also true, on the other hand, that some broken tulips have been in cultivation for more than three hundred and fifty

2. Slogteren, E. van and Ouboter, M. P. de Bruijn, Onderzoekingen over virusziekten in bloembolgewassen. II. Tulpen. I. Med. Landbouwhogeschool 45, Verh. 4, 1941.

3. For reviews of early literature on tulip breaking see:
Frylink, Adrian, The tulip. Part I. Its early history. The Garden Journal of The New York Botanical Garden, 1954: 4, 5-7, 15; and
McKay, M. B. and Warner, M. F., Historical sketch of tulip mosaic or breaking. The oldest known plant virus disease. The National Horticultural Magazine, July 1933: 179-216.

4. Cayley, Dorothy M., "Breaking" in tulips. Ann. Appl. Biol., 1928: 15, 529-539.

5. McKay, Marion Bertice, Brierley, Philip, and Dykstra, Theodore Peter, Tulip "breaking" is proved to be caused by mosaic infection. U. S. Dept. Agr. Yearbook, 1928: 596-597.

6. McWhorter, F. P., The antithetic virus theory of tulip breaking. Ann. Appl. Biol., 1938: 25, 254-270.

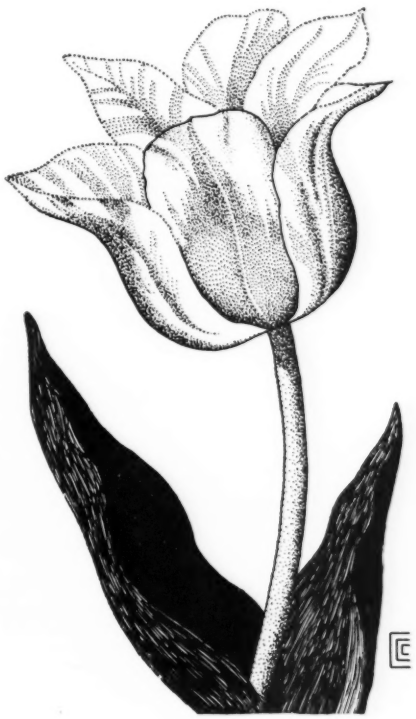
7. Slogteren, E. van and Ouboter, M. P. de Bruijn, Onderzoekingen over virusziekten in bloembolgewassen. II. Tulpen. I. Med. Landbouwhogeschool 45, Verh. 4, 1941.

years—for example, the Zomerschoon tulip has been known since 1620, and probably existed in Turkey before being introduced into Europe. When propagated by bulbs, a procedure which transmits the virus from generation to generation, these tulips continue indefinitely to produce broken blooms, but they exhibit no evidence of cumulative weakening effect of the infection. It is almost ironical to call a condition which has contributed to the spread of certain kinds of tulips all over the world, and has enriched the life of millions of people a disease. In some respects, broken tulips are like the frail-looking women who outlive their more robust contemporaries and inherit their wealth.

Flower breaking caused by various types of viruses has now been recognized in several plant species—the wallflower, the larkspur, the pansy, the camellia. Specimens of these flowers, which had been selected as new varieties, have turned out to derive their unusual and often desirable characteristics from viral infections. Certain other ornamental effects are also known to result from interference with the chlorophyll of the leaves by viral infection. The pale veined type of honeysuckle is probably the most recently recognized example of this type. Among the plants that became established as ornamental species because of a mosaic-type viral infection, one of the best known is *Abutilon striatum* var. *thompsonii* (also known in florist shops as flowering maple). It is easy to grow abutilon from seed and thus obtain plants free of virus, with green leaves unmottled and unstreaked. But the public favors the infected plants, because their leaves exhibit interesting patterns of variegation. Thus, abutilon owes much of its biological success (among men) to its accompanying virus. My colleague, Dr. Francis Holmes, informs me that all the specimens of the Wedgwood iris that he has observed are virus-infected. This iris—very popular in flower shops—is produced exclusively from bulbs and rarely exhibits any sign of infection except mottling of the leaves. Although flower breaking occurs in this species, it is unusual and not attractive.

Virologists regard the broken tulips and the ornamental abutilon as diseased plants, because they are virus infected—this despite the fact that infection does not affect the survival of the plants and has increased their world distribution. In contrast, botanists and general microbiologists regard many cases of bacterial and fungal infection as manifestations of symbiosis because of beneficial effects on the plant or animal hosts. The fixation of atmospheric nitrogen in legume plants by the nodule bacteria and the enhancement of seed germination in orchids and heather by fungi constitute familiar examples. Virologists will point out, of course, that the virus of tulip breaking often decreases the size and vigor of infected plants and occasionally causes the death of some. But the same probably holds true for many other types of biological associations known to have beneficial effects. Even the nodule bacteria of legumes can become invasive and kill their hosts under certain environmental conditions. As Noel Bernard pointed out long ago, symbiosis is always at the threshold of parasitism.

Many infections are known that protect the infected individual against infection with a more virulent strain. However, it is not easy to find in the literature examples of bona fide viral infection that virologists would accept as beneficial. One might regard certain viral infections that hasten the development of flowers in pome fruit trees, prolong the life of asters, or cause carrots to produce sterile seeds the first year, as having ecological advantage for the infected plants under certain conditions. But no proof of such advantage has yet been obtained. Suggestive also is the relation of some plant viruses to their insect vectors. Infected insects live as long and breed as freely as those not infected, even though the viruses multiply extensively in their bodies. Indeed, it has been claimed, but on the basis of inadequate evidence, that leafhoppers raised on celery or aster plants infected with aster yellows virus develop faster, live longer, and produce more young than those fed on healthy plants. Similarly, aphids fed on sugar beets infected with virus seem to be more fecund than those fed on healthy plants. It is possible, of course, that these beneficial effects are indirect and merely the expression of nutritional factors rather than of the presence of the virus in the tissues of the insect. But whatever their cause, their ultimate result may constitute an ecological advantage to the infected insect.



The rickettsia-like intracellular particles in insects and the chloroplasts in *Chlorella* might be registered as examples of useful infection, since they confer advantages and yet are not essential to survival of the insect or the plant—as shown by the fact that they can be eliminated by drug treatment. But endosymbionts are called plastids and not viruses by cytologists. It might be pointed out in passing that if endosymbionts with beneficial effects are called plastids by definition, then it becomes obviously pointless to search the literature for a useful virus.

Fortunately for my theme, there exist a few types of relationships between bacteria and bacteriophage for which objective evidence is available that the presence of the virus can be of advantage to the infected host under special circumstances. For instance, the diphtheria bacillus produces toxin only when infected with the proper kind of β bacteriophage. Toxigenic strains no longer produce toxin when "cured" of their bacteriophage infection and produce it again after being reinfected. As the non-toxigenic bacilli are unable to proliferate in living tissues, it is apparent that the biological success of this bacterial species is enhanced by bacteriophage infection. The transduction by lambda phage of galactozymase to K12

(Continued on page 66)

Pressing and drying plants is difficult under wet, tropical conditions. At Cana, the meager supply of unleaded gasoline had been exhausted and rather than allow specimens to rot, the plant collectors employed a wood fire. Above left—A plant press is being placed over such a fire for drying.

Above right—The last remaining building at Cana, the former office of the Darien Gold Mining Company.

PLANT COLLECTING in the Land of Balboa

By **William L. Stern**

Dr. Stern is Curator of the Samuel James Record Memorial Collection, School of Forestry, Yale University. In June 1960, he will assume the position of Curator, Division of Woods in the Smithsonian Institution, Washington, D.C. This Division will be coordinated with the other Divisions in the Department of Botany in the Museum of Natural History, of which Dr. A. C. Smith is Director.

El Darién, the Darien, the most remote and backward of Panama's provinces. El Darién, where from a hilltop near Cuarecua, Vasco Nuñez de Balboa sighted the seventh sea, the Pacific Ocean, in 1513. Although it is the site of the earliest settlements in the New World, until recently the Darien was a land whose true character was masked by exaggerated reports and distorted by half-truths. Only a few years ago it was still thought to be a country of high mountains, whose peaks were continuously enveloped in a shroud of clouds. The native Indians were considered to be fierce and sullen. The forests were said to be impassable. Late explorations by crews of the Subcomité del Darién, surveying the route through the Darien for the Interamerican Highway, have shown these extreme tales to be largely fictitious.

The Darien country is important; it is the transitional region between the North and South American continents. Historical geology shows us that in ancient times the seas swept over what is now the Isthmus of Panama, and the Darien was the home of the fish and the alga; there was no terrestrial life, as we know it. We are quite certain that at least until the end of the Mesozoic Era the North and South American continents were united by land. At some time during the earliest part of the Cenozoic Era, perhaps in Eocene time, the connecting lands subsided, and the waters of the Caribbean Sea flowed westward into the Pacific Ocean. An effective barrier was present, that must have seriously impeded the migration of organisms between the two great land masses. It was not until late Miocene times that volcanic activity, accompanied by mountain building, uplifted the lands from beneath the seas to form what we now know as the Isthmus of Panama. Thus, for the better part of sixty million years, there was no terrestrial link between North and South America.

As the isthmian lands continued to rise above the seas during the passing of the eons, plants and animals from the adjacent continents slowly moved across the newly formed land-bridge. The ground again became populated with terrestrial organisms; those from the north encountered those from the south. Some plants and animals remained on the isthmus, became established, and intermingled; others continued on.

The biologist, ever seeking to explain the intricacies of life, finds the present-day flora and fauna of the Darien of great interest. Organisms of both northern and southern affinities probably exist there; some which are peculiar to the isthmus itself are likely to have evolved in the passage of time. The Darien is thus a region of biological interchange, an area of flux. It is a bio-geographic crossroad.

The botanist viewing Darien for the first time wonders about the kinds of plants, their distribution, and their relationships. Are they largely akin to those of the Northern Hemisphere? Or is precedence taken by southern plants? Have any new species of plants, different from those of North and South America, evolved in this place of change? These were some of the questions on the minds of a group of botanical explorers when, in the spring of 1959, they first set foot at El Real, a town in Darien near the place where the waters of the two great rivers, Chucunaque and Tuira, converge on their restless

Victoriano brings in a zaino to feed the expedition.

voyage to the Golfo de San Miguel and the Pacific Ocean.

In the late summer of 1958 plans began to take shape at the Yale University School of Forestry; these were to culminate in perhaps the largest botanical expedition to the Darien. The author, leader of the expedition, is a member of the faculty of the School of Forestry; Professor Kenton L. Chambers and John E. Ebinger are in the Department of Botany. The three were Yale's representatives to El Darién, Panama. The Yale contingent, suitably inoculated against a number of tropical maladies and armed with anti-malarial drugs, was joined in Miami, Florida, by Professor John D. Dwyer of the Department of Biology at St. Louis University. Together the group arrived in Panama late in May 1959. Its objectives included a botanical survey of the Darien to be as comprehensive as time and resources would allow.

Each one had his own special field of interest. My own major concern was with woody plants and particularly the collection of wood samples for Yale's Samuel James Record Memorial Collection. Professor Chambers, keenly interested in cytotaxonomy, wanted to collect and preserve flower buds for subsequent cytological and genetic investigation. Mr. Ebinger, a graduate student, was desirous of gaining field experience in the tropics; Professor Dwyer's consuming interest was in leguminous plants. But we agreed that the object of the expedition — to find out what kinds of plants grow in Darien —was to come first.

We were fortunate in having excellent friends in Panama, facilitators, expediters, and red-tape cutters all. In these respects, John Brown of the Servicio Interamericano de Cooperación Agrícola en Panamá and Barney Forgeson of the Naval Research Laboratory (Canal Zone Corrosion Laboratory) were most helpful. However, had it not been for our close and fond association with Otis Imboden, photographer, linguist, trouble-shooter, camper par excellence, and all-round good fellow, the expedition would hardly have been successful. The U. S. Navy was kind enough to arrange for our transport by sea to Darien on the minesweeper "Falcon," and the U. S. Army ferried our equipment and provisions directly to El Real on an LCM, a landing craft able to negotiate the shallow waters of the Río Tuira. At El Real we occupied and used as a field headquarters the "office building" of

The flower of *Pereskia bleo*. This is a Darien cactus with broad leaves and tree-like aspect.

the Sub-comité del Darién, an agency of the Pan American Highway Congress in charge of extending the Interamerican Highway across the "Darien Gap" into Colombia.

El Real is a poor town. Most of the inhabitants are Negroes, Spanish-speaking descendants of the African slaves who trudged across the Darien with Peruvian gold, bound for the caravels of Spain lying at anchor in the Caribbean Sea. El Real has no regular plumbing, no sewage disposal, no healthy supply of drinking water. Only the two main streets are paved. The feeble municipal source of electricity functions for only a few hours at night. The general stores and cantinas are owned by a few comparatively wealthy Chinese. The dwellings are mostly unpainted, with walls of reeds and roofs of thatch or corrugated iron.

The major importance of El Real to the economy of Darien is its location at the confluence of the Ríos Chucunaque and Tuira; it is here in El Real that the produce of the interior of Darien is funneled to the markets of Panama. It is here that the plátanos (plantains) and bananas are loaded onto filthy coastwise motor-craft for passage to the markets of Panama City. It is here that manufactured goods and food are brought in from Panama City and unloaded for distribution by piragua to the smaller, up-river towns of Pinogana, Yapé, and Boca de Cupe. El Real is the prototype for the Darien towns — most of the others are more or less miserable in comparison.

With the help of Mr. Imboden and our guide, José Carretero, we selected three sites around which we would spend most of our time in the field: Paya, a Cuna Indian village on the Río Paya; Cana, the ancient locale of the colonial Spanish gold mines; and Campamento Buena Vista, a point on the Río Chucunaque just up-river from the confluence of the Río Tuquesa. We felt that with the relatively limited time available, we could sample the flora of these three quite different regions as well as the area around El Real.

At Paya we lived with the Cuna Indians in one of their chosas or huts. Their dwellings are walled with reeds, may be floored with split trunks of the black palm, *Astrocaryum standleyanum*, and roofed with the overlapping leaves of *Heliconia* spp. The Cunas are one of the groups of "aborigines" that in-

Quipo trees (*Cavanillesia platanifolia*) along the Río Tuira are the "trade mark" of Darien.

Boca de Cupe, perched on the banks of the Río Tuira, is subjected to flood by rapidly rising waters following an all-night rainstorm. The boats in the foreground are piraguas; the tree at left is a mango.

habit the Darien. Most of their number have been more or less "civilized" and are largely congregated on the Caribbean islands off the San Blas coast of the Isthmus of Panama. Others live along the upper Río Chucunaque and Río Bayano. These at Paya are the remnants, the poor relatives of the so-called San Blas Indians. Shy and relatively uncommunicative, the Cunas are exceedingly curious. We found them watching and discussing even our most intimate activities. Nevertheless, they were good hosts and became less shy during our stay. In contrast to the Chocó Indians who also live in Darien, the Cunas are fully clothed; the women are frequently arrayed in brightly colored blouses, molas, of intricately patterned, appliquéd cloth. Many of the women sport small gold rings in their noses and other kinds of jewelry.

At Cana we were in a remote part of a remote province, sixteen miles, as the oropéndola flies, from the closest habitation and certainly three or four times as far by our tortuous trail. Cana is located in a pleasant valley at seventeen hundred and fifty feet above sea level between Cerro Pirre and Cerro Setetule, two mountainous ridges in central Darien. The colonial Spanish had mined gold at Santa Cruz de Cana (Las Minas del Espiritu Santo) in the eighteenth century. However, because of repeated fracases with English pirates and renegade bands, coupled with the increasing difficulty of working the ever deepening mines, the Spaniards gave up their interests in Cana. Not long after, the mines were completely abandoned. Near the end of the nineteenth century interest in the Espiritu Santo mines was revived, the Darien Gold Mining Company Ltd. was formed in England, and for a time gold again flowed. Then in 1911 the Darien Gold Mining Company halted its operations and ended many decades of exploitation in the Cana area. The forest reclaimed what was originally in its domain.

At the time of the English venture a town of several thousand stood at Cana; there was plumbing, electricity, a railroad from the Río Tuira at Boca de Cupe, and other amenities of life. It is a weird sensation to walk in the forests of Cana today, to stumble over rusty railroad tracks, to see the remains of a sawmill, to step into the ramshackle dwelling once the office of the mining company and now the home of hordes of bats and wasps, to walk over crunchy, corrugated iron roofs resting on the completely disintegrated wooden house-frames, to peer into the inky dark recesses of long forgotten mine shafts, and to drink sparkling water from a pipe many scores of miles from the next nearest plumbing system.

On the Río Chucunaque we were fortunately quartered in relative comfort at the camp of the Panamerican Delhi Petrolera, a company prospecting for oil in Darien. We found ourselves

The Cunas at Paya live much as did their ancestors many hundreds of years ago. Their huts ordinarily have earthen floors, and the roofs are thatched with the folded leaves of heliconias. In contrast to the open-sided chozas of the Chocóes, Cuna huts are walled and entered through a door.

in the vicinity of several families of Chocó Indians. These Indians differ from the Cunas in many ways, including their lack of dress and the fact that they live in family groups rather than in villages. The men are entirely naked, except for a loin cloth; the women are bare-breasted, although they do wear a wrap-around type of skirt. The Chocóes, both male and female, like to adorn themselves in several ways. Their bodies are often grotesquely tinted, largely through the use of jagua *(Genipa americana)*, a small tree related to coffee. The juice of the fruit, although colorless, readily stains the skin an indelible dark blue or purple which on the Indians appears black. Lipsticks and dusting powders, obtained in the river towns, are also in vogue. But the scarlet lipsticks are used to decorate other parts of the body than the lips. Silver jewelry, in the form of enormous, many-parted earrings, bracelets, and necklaces of coins, is commonly worn by both sexes. The Chocóes are excellent river men. Standing upright in their narrow piraguas in swiftly flowing water, they create an impressive picture of litheness and skill.

Collecting plant specimens under tropical conditions is arduous at best. Our major effort was spent in gathering leafy twigs bearing flowers from the desired plants and arranging these in folded layers of newspapers, alternated with blotters and aluminum corrugates. Many such sandwiches were strapped tightly together and placed over gasoline or kerosene stoves on suitable supports in such a manner that the hot air rising from the stoves passed through the corrugates. The hot, drying air removed the moisture from the specimens adjacent to the aluminum corrugates that acted as flues. This is easier said than done. First, we always had to erect some kind of roof for our drying apparatus; second, we had to arrange for dry storage in the field of our dried plant specimens; and third, we had to maintain a supply of fuel at a great distance from our source of supply. Wood samples once cut had to be kept dry, and a shelter was needed for these also. The most troublesome problem of tropical plant collecting is to maintain dried specimens in a dry condition. The humid atmospheric conditions and frequent heavy rains are hardly conducive to this requirement. Improperly dried specimens, or dried specimens that become re-moistened, will mold rapidly and are thus rendered useless for subsequent study.

Frequently the plants in which we were interested were high trees, some in excess of one hundred feet. This meant having them felled — no mean task with some of those tough, hard-timbered tropical trees with trunks four or five feet in diameter. Often vines were of interest, and usually these were located in the tops of towering trees. Therefore in selecting men for our trips—besides boatmen, motoristas, trail cutters, camp helpers, and a cook—we had to obtain good axemen capable of handling these giant trees.

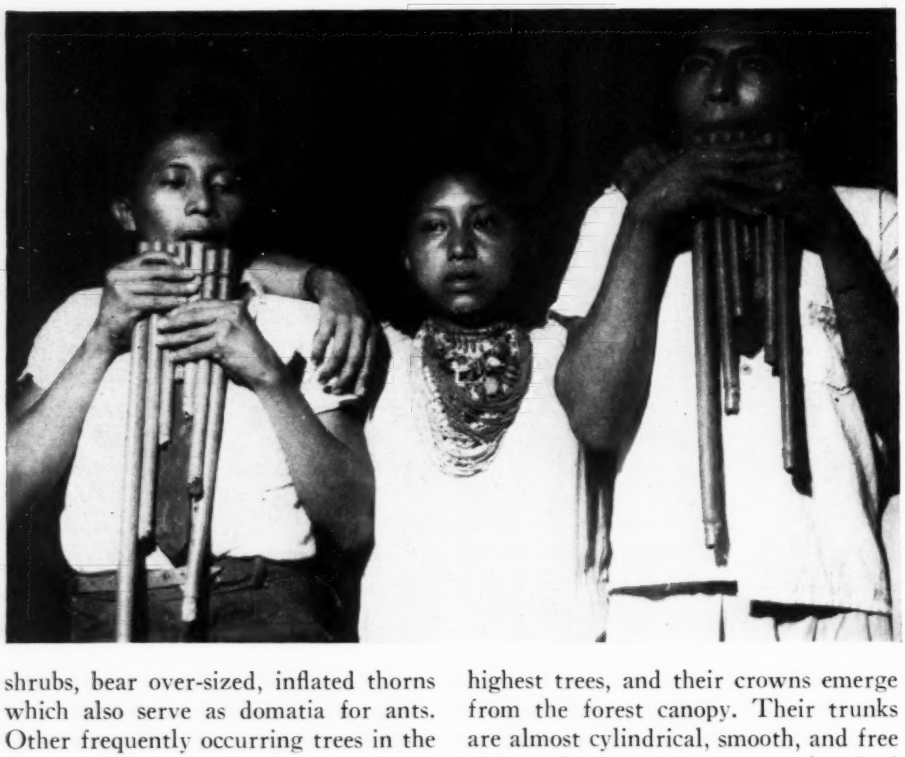
Originally, before man's agricultural abuses, Darien was probably completely covered by forest. This is still the case today over much of the province. For convenience the forests of Darien can be divided into virgin (original) and successional (that which returns after the land has been disturbed), and into riverine (along the rivers) and upland. Virgin riverine forests are still to be found in areas along the rivers that have not been employed for agriculture.

The most impressive of these forests are the pure stands of cativo *(Prioria copaifera)* and alcornoque *(Mora oleifera)*. Both are leguminous trees which bear pods that contain only a single seed. Forests of cativo and alcornoque occur on the river margins in soil which may be periodically inundated. Alcornoque occurs in the transitional zone where the sea water meets the downflowing water of the rivers. The lower branches of alcornoque nearest the water often overlap the river, forming an attractive bluish green fringe. Cativo trees are among the largest in the forest and may be well over one hundred feet tall and three to five feet in diameter at the base. The timber is useful as a general purpose wood and is commonly employed as face veneer or core stock in plywood.

Where the river margin lands have been disturbed, the virgin forest trees are temporarily excluded, and a variety of "weed" trees takes over the area. These trees persist, constantly modifying the environment, until conditions are again suitable for the virgin forest species to re-appear. The guarumo (*Cecropia* spp.) and palo santo (*Triplaris* sp.) are common, and their hollow stems serve as domatia for ants which live symbiotically with these trees.

At the slightest provocation, the ants swarm out, full of fight, and descend on any individual who has incautiously appeared in their path. It is said that the pirates of old, who used the ports of Darien as bases for their buccaneering, tied their prisoners to the trunk of the palo santo as a form of torture. The bullhorn acacias (*Myrmecodendron* or *Acacia* spp.), small leguminous

Although groundcover is often restricted in upland forests, which may be heavily shaded, ferns (lower left) may be common elements. The leaves of *Gustavia*, a member of the Brazil-nut family, can be seen in the upper center.



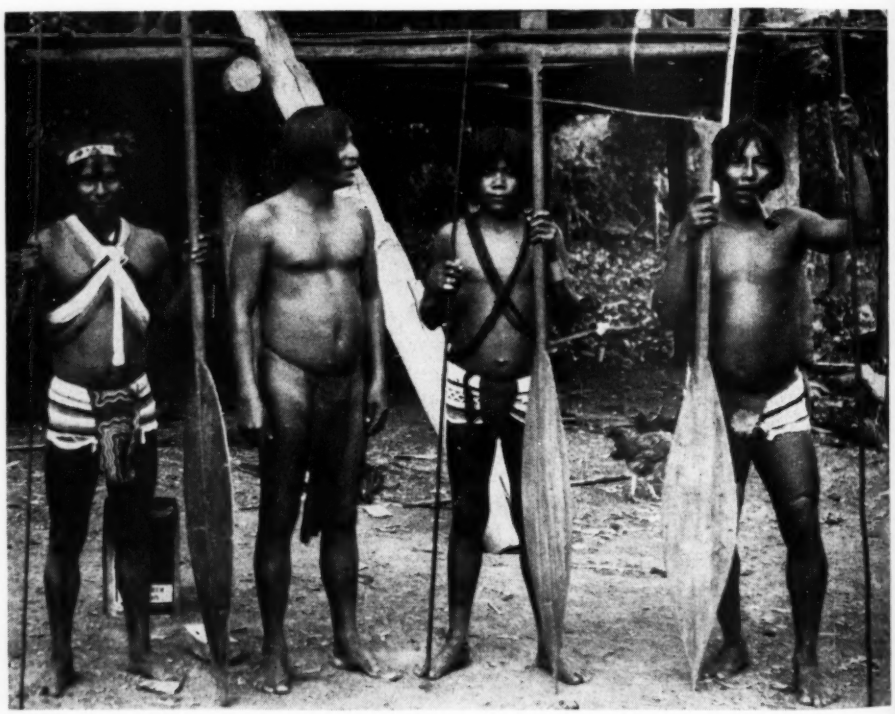
These young Cunas, playing their reed "pipes of Pan" at Paya, are in their middle teens.

shrubs, bear over-sized, inflated thorns which also serve as domatia for ants. Other frequently occurring trees in the successional riverine forests are guácimo *(Guazuma ulmifolia)* and balsa *(Ochroma pyramidale)*. Successional forests are often characterized by thicket-like or jungle growth covered with a topping of clambering vines.

The upland virgin forest presents an almost park-like atmosphere. Most of the undergrowth, characteristic of successional forests in general, has been shaded out. Walking is relatively easy. The forests are usually heterogeneous in composition, in contrast to the pure stands which may occur under the specialized conditions of the immediate river margin. An interesting tree of the upland forest is the amarillo de Guayaquil *(Centrolobium yavizanum)*, abundant along parts of the trail between Cana and Boca de Cupe. The fruits of this leguminous tree resemble huge, winged maple samaras with stiff spines borne on the seed containing end. Mahogany *(Swietenia macrophylla)* also occurs in the upland forests and is quite heavily exploited for lumber. The "trade mark" of Darien is assuredly the quipo *(Cavanillesia platanifolia)*. These gigantic trees occur on the uplands as well as near the river borders. They ordinarily tower above the next highest trees, and their crowns emerge from the forest canopy. Their trunks are almost cylindrical, smooth, and free of branches for sometimes one hundred feet. The base of the tree is buttressed, and the thickly folded bark at the base reminds one of the corrugated skin of an elephant. The crown is umbrella-shaped, and the branches are relatively stubby. In all, the quipo is the outstanding tree of Darien. Unfortunately, its soft, punky wood is worthless for use as timber.

Another interesting tree of Darien, especially on the slopes above the Río Chucunaque, is the bálsamo *(Myroxylon balsamum)*. The bark of the bálsamo is the source of the drug, balsam-of-Peru. The characteristic aroma of bálsamo bark is produced only when wounding induces the flow and subsequent oxidation of the sap to form the dark reddish brown, highly aromatic balsam. The wood is very tough and hard, purple and highly lustrous. It finds limited commercial uses for novelties and objects of turnery. Other trees of importance are the cocos *(Lecythis* spp.), relatives of the Brazil-nut tree, which bear coconut-sized, woody fruits; sangre (*Pterocarpus* sp.), a legume with blood-red sap; and bonga (*Ceiba* sp.), a huge, spreading tree with very heavy major limbs that dominate the wide-spreading crown. Nune *(Hura crepitans)* is a spiny-barked tree of the poinsettia family, whose milky white sap is reputedly a dermatotoxin.

Much of our travel was by means of the rivers, the highways of Darien. The craft were large native piraguas, boats especially suitable for travel on rapidly flowing streams. The piragua is constructed of a single, hollowed-out tree trunk—frequently espavé *(Anacardium excelsum)*, cedro espino *(Bombacopsis quinata)*, or cedro (*Cedrela* sp.). Its



A group of Chocó Indian men stand before their stilted chosa. The lance-shaped paddles are characteristic of those used throughout Darien.

bottom and sides are thick and capable of withstanding the pounding of rocks when "shooting" rapids. Piraguas can be poled, paddled, or, as is commonly the case these days, equipped with powerful outboard motors. We employed two piraguas, one powered by an eighteen-horsepower motor, the other by a thirty-five–horsepower motor. These strong engines were especially necessary when pushing our heavily laden boats against the swift, downstream current.

Although we employed riverine roads to a large extent, our four-day trip into Cana was on foot from the Tuira town of Boca de Cupe. Our supplies and equipment were lashed to five bedraggled, beaten beasts—and we had little hope of their reaching Cana. After the first few rugged miles, however, we changed our opinions. These poor horses outdistanced us over the muddy, rain-soaked trails and except for some rather ugly, friction-induced sores on their backs, made the round trip in better shape than we did.

Much of the time in the field was spent en campamento. We slept in jungle hammocks which if slung properly, and with a little luck, are the ideal way to spend nights in the tropical forest off the verminous ground, screened from winged varmints, and protected (more or less) from the rain.

Cooking, of course, was done over an open wood fire. "Changu," our cook, was very adept at manipulating the intensity of the fire. The fire was set with five or six logs arranged in a spoke-like manner. By moving these "spokes" into or away from the "hub," more or less heat could be produced at the center of the fire. Pure water was a problem, especially near habitations where some of the populace were almost certainly infected with intestinal amoebae or bacteria. To combat this threat, all drinking water was treated with "Halazone" tablets which release chlorine into the water and render it potable; bad-tasting, but safe.

Food consisted mainly of rice, the staple in Darien, which we supplemented with a variety of tinned soups, tuna fish, coffee, crackers, mixed vegetables, corned beef, fresh onions, condiments, and whatever game our hunter, Victoriano, could produce. It was surprising to us that with our fairly well-balanced supply of foodstuffs, "Changu" would conveniently "forget" to prepare soups or hot chocolate, or to serve fruit juices. It was evident that our men preferred rice to everything else, and so we were fed mostly on rice until we insisted on other foods. A quantity of canned "soda pop" and alcoholic beverages rounded out the liquid refreshments and served to relieve the tedium of drinking "Halazone"-treated water. Whiskey was a very pleasing and stimulating toddy after a sun-up to sun-down tramp, largely in the driving rain.

There were times, especially on our trip to Cana, when we were quite low on "regular" food. Victoriano had poor luck hunting, and we were reduced to eating whatever was brought to our table. The pavo, or turkey, is a black, arboreal fowl; but only in being a fowl does it resemble what I know as a turkey. When well stewed and seasoned, it makes a respectable repast. The toucán has always been a bird which I associated with the flight cage in the zoo. However, these snout-heavy birds, I learned, are also edible if this term is used in its broadest sense. The culmination of our avian fare was a parrot, guaca, a most gorgeously attired bird—but the meat of the parrot is as tough as his raucous, strident call indicates. We lived much better when some of the mammalian game was brought in. A zaino or wild pig proved to have delectable meat, smoked and eaten as ham; the tender flesh of the venado, a kind of deer, was a welcome change, even though we ate it for three consecutive meals to keep it from spoiling. The ñeque, a large rodent, is also savored by the hungry. Game is really quite abundant in the more remote areas, and if one is not too fastidious, or is very hungry, he can live rather well.

Every trip has its exciting moments, those we would care not to, or to, live over again as the case may be. For me, the most impressive experience took place immediately on our return from Cana to Boca de Cupe. After a forced hike we arrived, mud-covered, sweat-soaked, and weary-worn, late in the afternoon at Boca de Cupe above the banks of the Río Tuira. Our plan was immediately to load our piraguas and head downstream in the gathering dusk to El Real. Our motorista, "Nandu," was well acquainted with the river, and we had no fears of traveling in the dark. However, as we got under way, a rainstorm overtook us and proved so heavy that we thought it best to return to Boca de Cupe to spend the night. After a great deal of difficulty, our piraguas were turned about in the racing river and tied up at Boca de Cupe. Grabbing whatever personal gear was at hand, we scrambled up the ladder that led from the river to the bank on which the town was situated. There we headed for the schoolhouse which had served as our "hotel" on another occasion. We wrung out our thoroughly soaked clothes, put on whatever dry clothes we had salvaged from the piraguas, inflated our air mattresses, and prepared to make ourselves comfortable on the floor of the schoolroom. After moving my pallet from beneath one leak in the roof to another, I finally found a dry spot and fell into a deep, soundless slumber brought on by the strenuous activities of the day. It rained all night; the corrugated metal roof resounding mightily to the impact of the hundreds of thousands of rain drops —but we slept.

Morning rose gray, and the rain had stopped. From my mattress I gazed out the open door and was startled to see the river parallel with the bank upon which the town was perched. Only last night, I recollected, we had climbed fifteen feet from where our piraguas were tied to gain the lip of the bank. Our piraguas! Where were they? They could not have withstood the terrific onslaught of the Tuira in flood. Hundreds of specimens — the results of a week of collecting at Cana — were in those boats, to say nothing of our equipment. As I drew on my trousers, I could see huge tree trunks being tossed about in the river like so many toothpicks in a teacup. Flotsam was everywhere, twirling, whirling, caught in the gigantic, muddy brown maelstrom. All the tributaries were pouring their watery burdens into the Tuira, riverside trees were undermined, huts swamped and overturned, Indians forced to flee their chosas. The river had risen fifteen feet at Boca de Cupe in just a few hours!

Walking along the bank next to the racing turmoil, Professor Chambers and I, disconsolate, sadly contemplated our loss. At least the others who were still sleeping did not yet know about it. Then, glancing downriver some distance, I thought I saw a red piragua

(Continued on page 64)

THE VOID IN AMERICAN HORTICULTURAL EDUCATION AND HOW TO FILL IT

By **Donald P. Watson**

Dr. Watson is Professor of Ornamental Horticulture at Michigan State University, East Lansing, Michigan. As Chairman of the Commission on Education of the American Horticultural Council, he gave an illustrated report on his survey of horticultural education in foreign countries, at the American Horticultural Congress, Rochester, New York, in October 1959. The following paper has been developed from his report.

Appreciation of Horticulture

Renowned horticulturists in foreign countries are not necessarily products of a university. Actually, in countries that have a real appreciation of horticulture, where technical schools are quite plentiful, and practical experience is respected, university graduates in horticulture are very scarce. University graduates of all kinds are relatively few.

In many places, horticulture seems to be better understood by the man on the street than in this country; and because of this greater appreciation, a horticulturist is rated among the most highly respected of the professionals.

During my recent visit to Sydney, Australia, editorials in newspapers, talks on the radio, and conversations generally were most concerned about the fate of the trees that stand where the new opera house is going to be built. In the subway stations, "Timely hints for gardening," listing early autumn chores for the week of March 3, 1959, were sponsored by Bayer aspirin. These indicate that the interest in horticulture is strong in Australia.

The quality and variety of apples, pears, grapes, and mangoes in the average fruit stores in Auckland, New Zealand, compare favorably with those in the bon voyage shops on Madison Avenue in New York, in the City of Paris or San Francisco. These fruits are wrapped individually, handled as prized specimens, and are better than many that are exhibited at our county fairs.

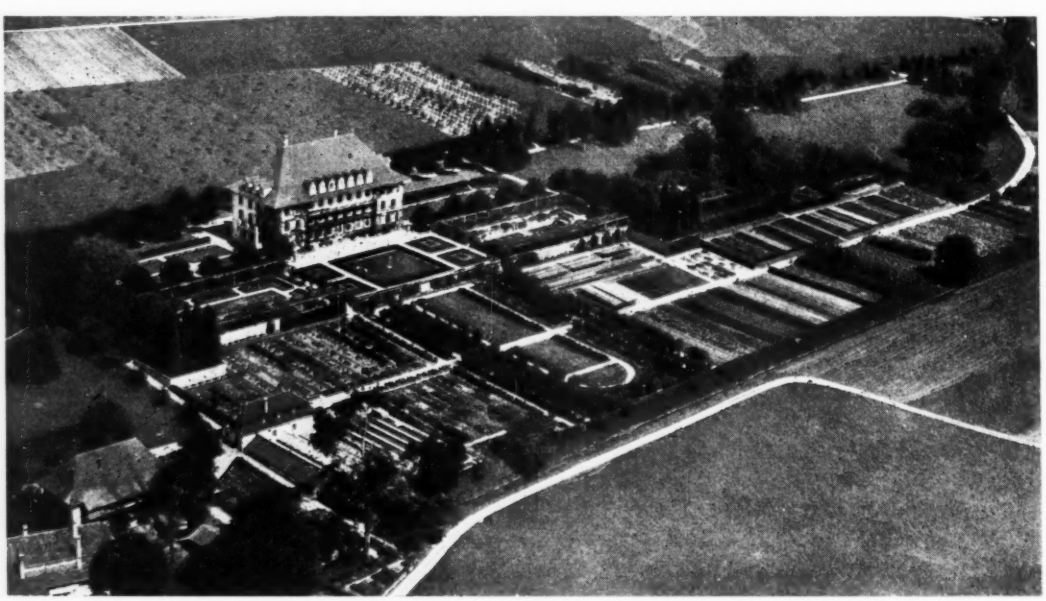
In Japan, I found flower arrangements in the cab of a truck, in a public washroom, on a bar, and on the counter of what would correspond to our hot-dog stand—good proof of public appreciation of horticulture. When I visited the agricultural director of Saita Prefecture, he proudly displayed a potted strawberry plant on his desk. It was in flower and had some small green fruits, as well as some that were expanding and beginning to turn color. It was the ultimate display of skill of his profession and the item of conversation among his professional and business associates. He went on to explain that the nursery business had been especially good this year, the year of the marriage of their prince, bec[illegible] the Japanese always plant [illegible] memorable occasion. Thi[illegible] mick to stimulate sales—[illegible] gesture which further den[illegible] general appreciation of ho[illegible]

More money is spent f[illegible] tenance of the grounds of t[illegible] ment House than for any o[illegible] arden in the capital of the Fiji Islands. This is a colonial necessity—it is considered the best way to impress the inhabitants with the stature of the public officials.

In Europe especially, the demand for flowers has developed shops which offer great variety for sale. Appreciation of science itself and of its direct relation to the skills of horticulture was well demonstrated at the garden display in Zürich this past summer. There the science section of the exhibits had as a slogan, "Science is in the service of the gardener."

Technical Schools

Schools of a technical and vocational nature are more numerous in most countries than they are in the United States. Burnley in Melbourne is probably one of the top schools for horticultural education in Australia. It is not large, but it offers a one and a two-year course with diploma for prac-



Ornamental gardens, greenhouses, propagation areas, and orchards are maintained by the students at Oeschberg Horticultural School, Koppinger, Switzerland. Dr. W. Meir, Director, in furnishing this picture taken several years ago, recalled his pleasant visit to The New York Botanical Garden in 1933.

At the Garden Center in the heart of the bonsai nursery area, Urawa, Japan, customers are invited for tea while contemplating their purchases.

A corner of a bonsai nursery in Urawa, Japan.

tical and scientific training, and its graduates are well respected throughout the whole British Empire. At Hawkesbury, north of Sydney, is located a fine technical agricultural college where training is offered in fruits, vegetables, and food processing, phases of horticulture which fit directly into the agricultural production of that area. The Sydney Technical College is developing an unusually good school at Ryde, west of the city. Many of the students are enrolled by their employers in specially timed late afternoon and evening courses. Sixteen thousand students in Sydney alone, a city of three million people, are being exposed in any one year to some courses in agriculture in central schools, high schools, agricultural high schools, and technical schools. Australians appear to be doing a very good job of training professional horticulturists, but as yet there is very little responsibility for this training in the hands of the universities. Many prominent horticulturists in Australia would like to develop a more advanced scientific type of training. The first step in this direction has been the recent introduction of a chair of landscape architecture at the University of Melbourne.

In Japan, state-financed technical schools are not plentiful; actually, there are fewer vocational schools of horticulture in Japan than in most foreign countries. Its system of operation is more similar to that of the United States; yet the young people have a greater natural appreciation of plants and learn much from their parents, who have been "plant" people all their lives. The Takii Seed Farm near Kyoto operates its own horticultural school, with an average enrollment of sixty students for the first year and twenty for the second year. This large company believes that this tax-deductible item, which it is operating, is one of the most valuable parts of its business. It not only trains well-rounded horticulturists, but from them the Takii Seed Farm picks specialists for plant breeding both for its own and for competitive seed businesses.

At Oeschburg, Switzerland, is located one of the best colleges of horticulture in Europe. It is a cantonal school offering a one-year course for about twenty students, followed by two extra winter semesters for twenty students who are selected on a competitive basis. It is a small personal operation. The tuition is not high, but a large fee is collected for books, trips, and other special features. The Canton of Berne has five schools of agriculture, one for dairying, and this one school for horticulture. Ten per cent of the income comes from the federal government and the rest from the Canton itself. One of the most obvious observations is the balance that is maintained in all horticultural disciplines. The students move in the afternoons in weekly shifts from the orchard to the vegetable garden, to the ornamental gardens, to the propagation gardens, and the greenhouses in which fruits, flowers, and vegetables are grown. Chatelaine in Geneva has a similar operation.

Built on the principle of the Danish folk high school, Sohus Horticultural School in Odense is probably the newest horticultural school in Europe. It provides no practical experience whatever and was instituted by a group of growers who expressed the need for more scientifically trained people. Fifty per cent of the money for its construction was provided by these growers at an interest rate of four per cent: the other fifty per cent was obtained from various credit organizations. All of the crops produced at the school are sold on the wholesale market. The growers of horticultural crops in Odense are actually in the business of education. The forty students are selected and sent to the school by the growers themselves. Each student is required to have had from four to six years apprenticeship before he is admitted. The school concentrates for one year on the scientific aspects of plant growth through formal classes and on the students' observation of practical demonstrations of these principles by the instructors.

In England, much of the technical horticultural training is provided by parks, estates, and botanical gardens. Kew Gardens, Wisley, Edinburgh Botanic Garden, and other places are very rapidly raising the scholastic requirements for admission and introducing more science into their curricula.

Universities Stress Practical Experience

Professional horticultural educators in foreign countries make no excuse for placing great emphasis on practical experience. In Australia, it is not possible to obtain a degree in agriculture without having had at least one year of practical training in a vocational high school or college. The University of Kyoto in Japan operates its own farm and all undergraduate students, before being allowed to complete horticultural training, must spend at least one year working in general agriculture, including all branches of horticulture. In Italy, students have a heritage of gardening, and there are thirteen agricultural colleges, four or five of which are located at universities. Switzerland seems to separate the practical training from the scientific training and has built unusually high quality into the offerings at Oeschburg and Chatelaine, leaving much more of the science of horticulture to the botanists at a university level. This is somewhat true in England and Denmark, although in no university could I find four-year graduates who had not been required to have much more practical experience than is required in most institutions of

(Continued on page 69)

PLANS ARE REVEALED FOR U.S. EXHIBIT AT THE FLORIADE

THE U.S. Exhibit at the Floriade, the International Horticultural Exposition in Rotterdam, March 25—September 25, 1960, will be a major attraction not only for Americans but for the rest of the world. This is the first time that our government has ever participated in a horticultural exposition abroad.

Equally important is the fact that the exhibit results from cooperation between our government and its citizens. The U.S. display at Floriade, covering three and one-half acres, is sponsored jointly by the Foreign Agricultural Service, United States Department of Agriculture, and the American Horticultural Council.

Dr. Russell J. Seibert, Director of Longwood Gardens, has chaired the American Horticultural Council's U.S. Exhibit Committee which has worked for nearly a year obtaining exhibits and materials from private and commercial, professional and educational horticultural interests to present a display that will be truly representative of American horticulture. The Finance Committee, headed by Dr. Albert J. Irving, is attempting to muster urgently needed additional funds to pay for exhibition expenses incurred on this side of the Atlantic. Contributions to this endeavor are tax-deductible.

As Carl F. Wedell, Director General of the U.S. exhibit, explains: "Here is a unique opportunity for those of us who care about horticulture to demonstrate that Americans love flowers and trees just as much as do other people. We are provided with an exceptionally effective method for revealing that Americans are not a one-sided materialistic people; on the contrary, we are one of the most active and advanced nations horticulturally."

Mr. Wedell, a past president of the American Horticultural Council and former dean of the New York Agricultural and Technical Institute, is directing activities with the administrative assistance of Miss Frances Borden of Edward Gottlieb and Associates. U.S. Exhibit Committee headquarters of the American Horticultural Council are at 640 Fifth Ave., New York City.

American Highlights

An outstanding feature of the U.S. exhibit will be a Techbuilt, pre-fabricated, single-story, patio-type home, typical of middle-income American family living. The home will contain six rooms.

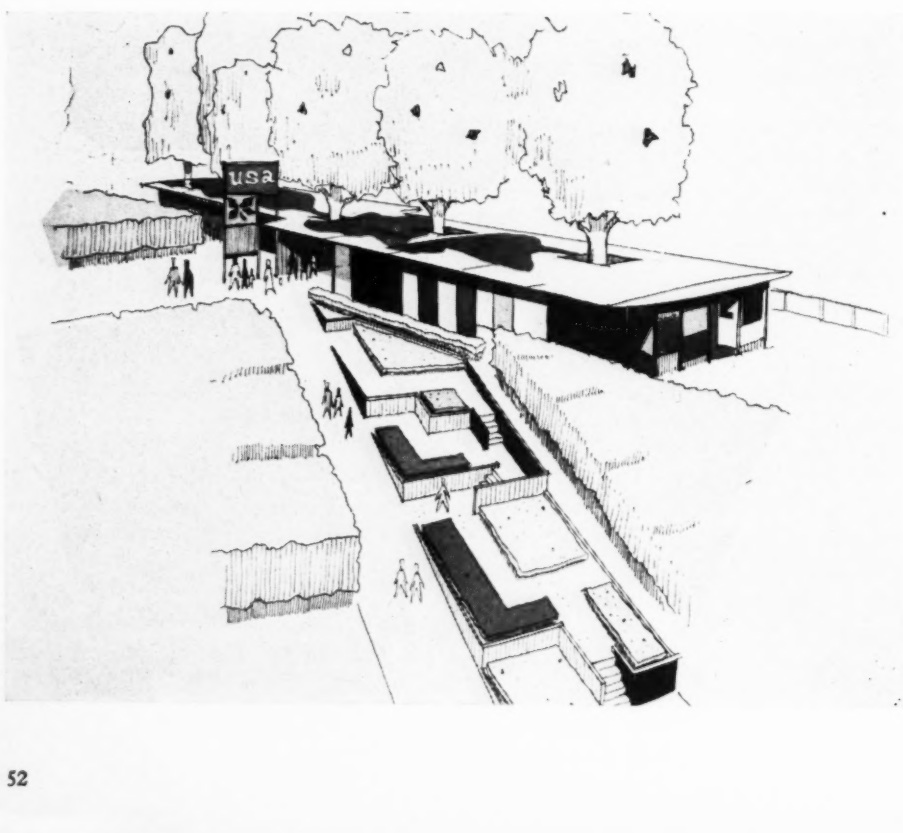
Emphasis will be on the American way of life today rather than on a way of life available in the future. The display will reveal to the world how the mass of Americans really live — the kind of home they have, their furnishings, and, above all, their garden. This family garden will be in bloom throughout the entire six months of the Floriade. Landscaping includes evergreens, azaleas, and cherry trees.

The poster of the forthcoming International Horticultural Exposition symbolizes the theme "from seed to force." Nine nations, including the United States, will participate in the exposition which celebrates the four hundredth anniversary of the introduction of the tulip into Europe.

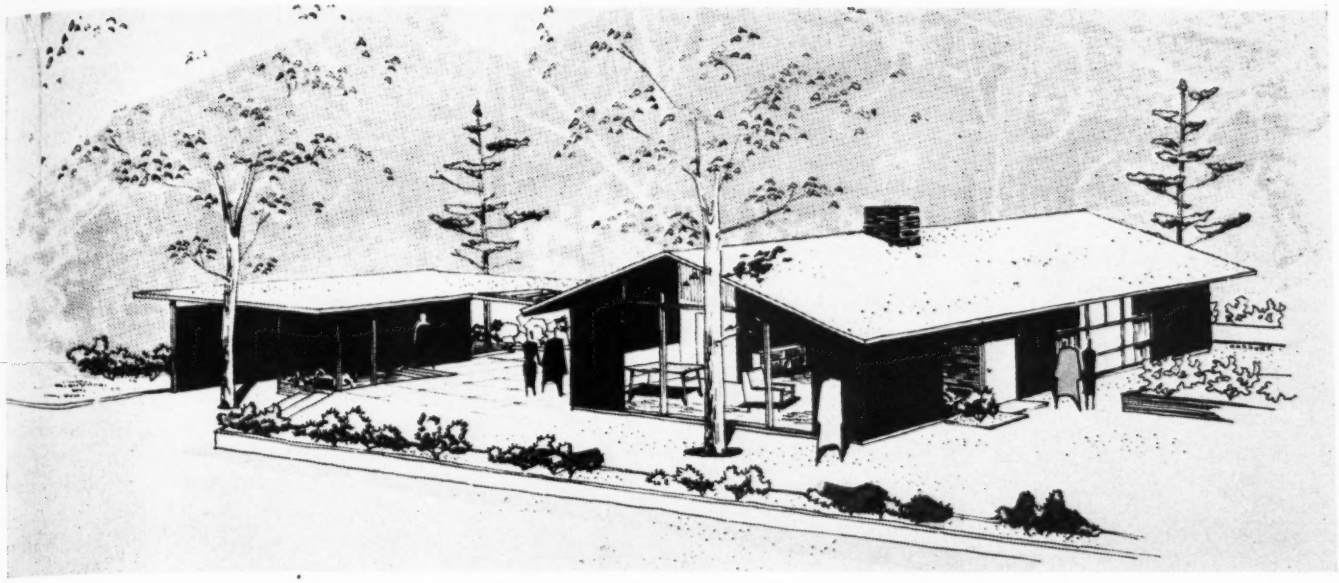
Redwood, supplied by the Simpson Timber Co. of Washington, will be featured in facings on the American home and elsewhere in the exhibit, since it is so uniquely American and consequently of exceptional interest to other nations.

Rose Gardens and Greenhouse

Because roses are among America's most popular flowers, the U.S. exhibit will include a unique display of American-bred roses assembled by All-America Rose Selections and the American Rose Society. In this five-thousand square foot area of fragrant blooms, there will be a plastic greenhouse containing tropical and subtropical plants. The Lord and Burnham greenhouse



This is the entrance to the U. S. Exhibit at the Floriade. Trees are growing through the roof of the exhibit shelter because the Dutch in establishing the Floriade have prohibited removal or destruction of trees in the Rotterdam Park area.

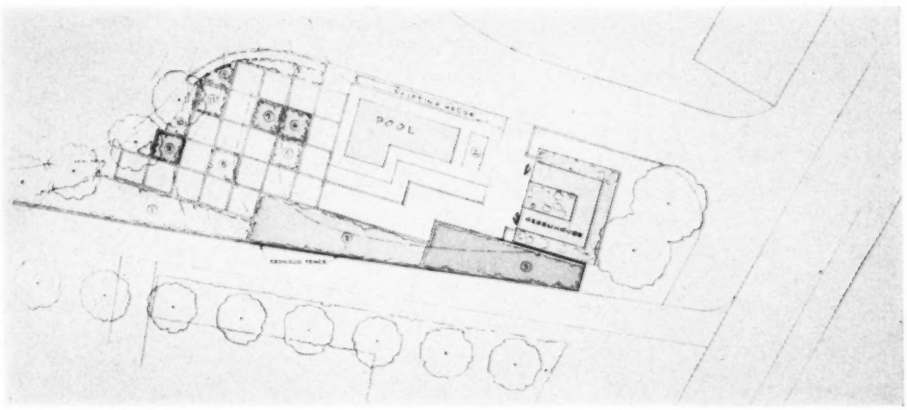


Dominating the U.S. exhibit will be a typical middle-income American home with garden. The house, a pre-fabricated, single-story, patio-type, has six rooms for an average family of four.

will interest European and Asian visitors as a sample of American pre-fabricated, easily assembled greenhouses in plastic coverings.

Terraced Gardens

Leading up a slope to an exhibits pavilion will be a magnificent series of terraced gardens, with a wide variety of flowers. The changing floral parade during the six months of the Floriade will start with spring-flowering tulips, culminating in a breath-taking array of autumn chrysanthemums. Masses of the famed Burpee marigolds will be a summer highlight.



The fine display of roses to be included in the U.S. exhibit was coordinated by All-America Rose Selections and the American Rose Society. Adjacent will be a pre-fabricated plastic greenhouse including orchids and other tropical plants.

Arnold Arboretum

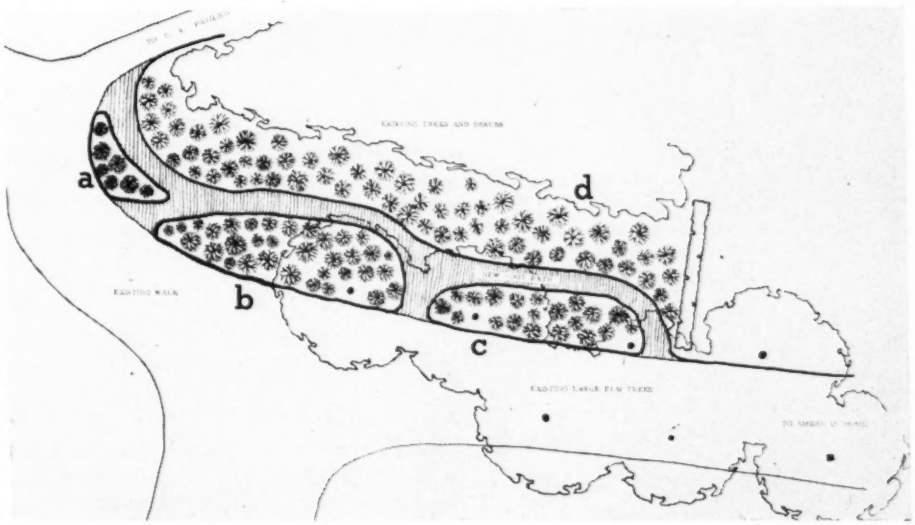
Close by will be an extensive display of the species and varieties of plants introduced by Harvard University's Arnold Arboretum to our own land and to others. Along the peaceful walks of the Arnold Arboretum exhibit area, high above a river, different varieties of ornamental plants will emphasize the valuable role played by America's arboretums and botanical gardens.

In other areas of the three and one-half acre park site will be exhibits by the U.S. National Arboretum, Longwood Gardens, the Morton Arboretum, and the American Association of Botanical Gardens and Arboretums. Colonial Williamsburg will be represented by a colonial formal garden.

A comprehensive library and information center will feature technical as well as popular horticultural publications. *The Garden Journal*, as well as

(Continued on page 67)

The contribution that the Arnold Arboretum, Jamaica Plain, Massachusetts, has made to American horticulture will be one of the main attractions of the U.S. exhibit. The display will feature plants introduced by the Arboretum over the last fifty years.



THE ECOLOGY OF INVASIONS BY ANIMALS AND PLANTS. Charles S. Elton. 181 pages, illustrated, indexed. John Wiley & Sons, Inc., New York. 1958. $5.25.

A REVIEW

***By* Jack McCormick**

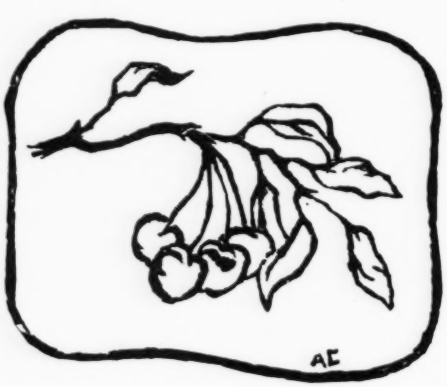
Dr. McCormick is in charge of Vegetative Studies at the American Museum of Natural History.

THE HUMAN POPULATION of our earth is not only growing larger, but human beings are also becoming more demanding of foods, raw materials, and space. Because of these circumstances, man is pressing harder than ever before into formerly unexploited or slightly exploited areas. Each time his exploitations spread or intensify, there are new disturbances in the organization of natural communities. Invasions of areas by foreign species of plants and animals and their parasites rank high among the forms of disturbance. The histories of many such invasions are considered in this book, and from them are drawn general inferences to the mechanisms and results of invasions and also to the balances that exist within and between communities as a whole.

Some conception of the importance of this book and of its fascination for the reader can be obtained from Dr. Elton's statement that our generation has a ringside seat for one of the great convulsions in the history of the world's fauna and flora. He points out that many species are able to achieve a world-wide distribution without human aid because they possess exceptionally efficient means of dispersal or are not held back by the various natural barriers that check the spread of other organisms. Examples of these are the arctic tern, golden plover, barn owl, reed grass (*Phragmites*), countless microscopic forms, and others. Many plants and animals, however, do not possess dispersal mechanisms sufficient to allow them naturally to colonize suitable areas in all parts of the world. These species are restricted to certain regions and have led to the recognition of modern floristic and faunistic realms within each of which there are rather closely related forms that do not occur in other realms. As man purposely or unintentionally disseminates these restricted forms throughout the world, he is contributing to a fantastically rapid dissolution of the biotic realms. To quote Dr. Elton, "If we look far enough ahead, the eventual state of the biological world will become not more complex but simpler—and poorer. Instead of six continental realms of life . . . there will be only one world, with the remaining wild species dispersed up to the limits set by their genetic characteristics, not to the narrower limits set by mechanical barriers as well."

Simple communities are very unstable and are subject to strong oscillations of population and even to local extinction of species. Oceanic islands are representative of such simple communities and have been found to be extremely vulnerable to invasions by foreign species and, subsequently, to frequent outbreaks of population. And it is common knowledge that cultivated areas — habitats that have been modified and greatly simplified by man—are the most frequent sites of invasions and outbreaks. On the other hand, in a stable natural community, as a forest, population outbreaks are rare and are damped down to a remarkable degree. Invading species "find themselves entering a highly complex community of different populations, they will search for breeding sites and find them occupied, for food that other species are already eating, for cover that other animals are sheltering in, and they will bump into them and be bumped into —and often be bumped off."

Still, a minor number of foreign plants and animals are able to penetrate into forests and natural bodies of water. Outstanding examples of invaders of American forests are the gypsy moth, brown-tail moth, winter moth, birch-leaf miner, cottony beech scale, spruce sawfly, elm leaf beetle, and other insects, and the chestnut blight. To these could be added Japanese honeysuckle, a dangerous pest in many forested areas of eastern North America; bird cherry, *Ailanthus*, and *Paulownia*, invaders of forest edges and openings; and several other introduced woody and herbaceous species.



It has been found that the instability of simple population systems can be mitigated, at least in part, by the provision of additional protection in the form of cover. And it has also become evident that variety in a community leads to greater stability. For example, an apple orchard—which is less complex than a forest, but infinitely more complex than a cornfield—may be populated by a hundred or more species of animals. Some of these are harmful, but most are beneficial, or at least not obnoxious. Left to themselves, the animals in an orchard will achieve a balance between themselves, although the fruit produced by the orchard may not be of the quality or quantity desired. To a large extent, the difficulties experienced with wave after wave of orchard pests are due to the upsetting of the population balances by the use of poisons which not only kill the intended victims, but may also kill their enemies and many unrelated species.

To Dr. Elton, the various lines of evidence suggest that we must re-orient our concepts of land exploitation and development. Rather than progressing further on the road toward single crop agriculture, uniform pastures and ranges, plantations of single tree species, and chemical panaceas for insect and weed control, we should strive for diversification of the landscape and the re-establishment of many natural population checks. In short, we should "conserve variety." Dr. Elton considers that "we are faced with the life-and-death need not just to find out new technological means of suppressing this plant or that animal, but of rethinking and remodeling and rearranging much of the landscape of the world that has already been so much knocked about and modified by man; while at the same time preserving what we can of real wilderness containing rich natural communities . . . we require fundamental knowledge about the balance between populations, and the kind of habitat patterns and interspersion that

(Continued on page 83)

TALL PLANTS FOR THE HERB GARDEN

By **Helen M. Fox**

Helen M. (Mrs. Mortimer J.) Fox is interested in shrubs, lilies, perennials, but especially in herbs. She is the author of several books and many articles on gardening.

THE FIRST herb garden I saw was near Tours, France, where I was spending the summer many years ago. It adjoined the dwelling of a priest and was close to the kitchen entrance. Every morning I watched the cook who came out to gather herbs. The plants were low and, as in other old-time herb gardens designed in the classical style, consisted principally of culinary herbs such as summer and winter savory, tarragon, mint, basil, and sweet marjoram.

In a notable herb garden nearby at Villandry, the beds, a combination of vegetables and herbs, were planted with regard to color of foliage and were bordered with cordon fruit trees.

Some years after my first herb book had been published, I visited Helen Webster's garden in Lexington, Massachusetts. There for the first time I saw a present-day collection of herbs set out in a naturalistic fashion. I was then growing herbs in little beds in the vegetable garden, each herb by itself. Mrs. Webster did as I was to do later—she grew a great variety of plants that could be classified as herbs. Among them were many tall plants, and all were set out in what might be described as loving confusion—but the total effect was lush and healthy.

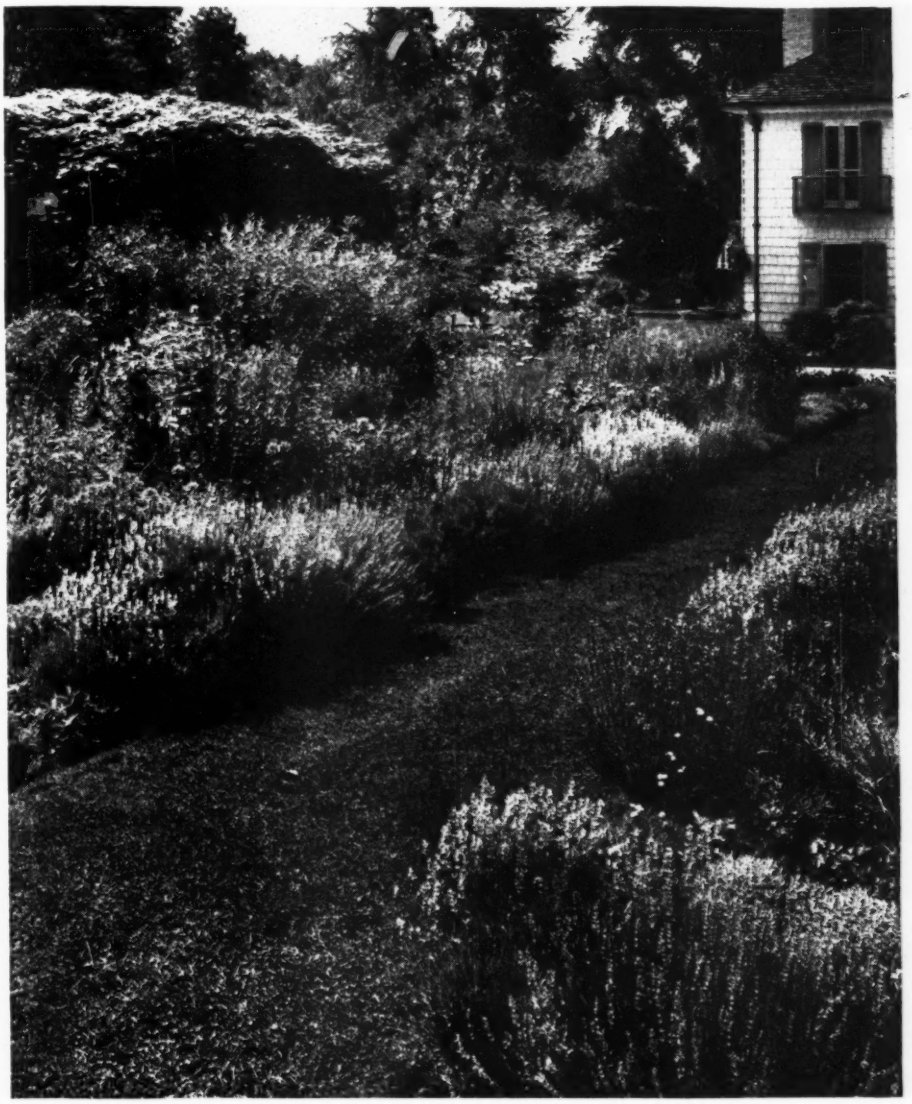
In the herb garden of today, the planting is no longer low and even; instead, high plants rise above the others. But if there is to be some kind of pattern or order, the tall plants are best kept at the back. No matter how striking the new introductions are, the herb garden continues to be a place where soft greys predominate, where fragrance is all-pervading, and where texture is more conspicuous than color.

When one is deeply interested in any subject, information seems to come one's way, and the horizon grows wider as time passes by. Every year a few herbs that are new to me are grown in my garden, but they are not kept unless they add to the beauty of the planting.

As the search continues, I realize that almost every plant has some herbal use and many, such as peonies, hollyhocks, and columbines, formerly not considered in this category, are now included. No longer dependent on herbs for drugs, we use them as teas, for flavor, for fragrance in sachets and potpourris, and to ameliorate slight disabilities and indispositions.

This year for the first time I grew the castor-oil plant, *Ricinus communis*, also called Palma Christi, from Africa. Rising as it does to eight or ten feet, with broad, deeply incised leaves measuring twenty-eight or more inches across, perhaps it is too large for the herb garden. Its tropical growth does dominate the whole scene. However, it was fun to grow for one season. Since *R. communis* is annual and not hardy, the seed was sown indoors in March. After the seed had germinated, the little plants were moved to "jiffy" pots (made of peat) and then planted outside when danger from frost was over. The plants did not grow much until August, when suddenly it was as if "Jack's beanstalk" had arrived, for the castor-oil plant grew and grew.

The flowers are monoecious with the staminate ones below the pistillate.



A path through the author's beautiful herb garden in Bedford, New York.

Black snake-root, *Cimicifuga racemosa*.

They are inconspicuous and arranged in panicles under the leaves. The beauty of the plant rests in the leaves, which look like green concave umbrellas dropped one above the other. The stems are hollow and tinted red. As each leaf dies, a circular scar remains, so in time the main stem resembles bamboo.

In addition to its well-known use as a cathartic, the oil from the fruit is valuable as a lubricant for delicate machinery. *Ricinus communis* is being grown commercially principally in Brazil and Central America; also, and oddly enough, in Oklahoma.

The leaves of *Datura stramonium*, called thorn-apple, apple-of-Peru, and Jimson-weed, yield an important drug, namely, stramonium. *D. stramonium* is a vigorous annual, much too weedy and not handsome enough for the garden. However, its relative, *D. meteloides*, which furnishes scopolamine, a drug similar to belladonna, is a handsome plant. It has a spreading habit and grows three feet high. The round green stems are soft to the touch; the leaves, tinged with plum, velvety green above and lighter on the underside, are unevenly shaped and four inches long. The erect, eight-inch long, fragrant flowers are stunning; the corollas, tubular and flaring, white marked with rose or violet, grow out of tubular green calyces having five pointed lobes. Each of the five indentations of the calyx separates near the base and persists as a cup or crown on the large bristly fruit. The only drawback to this plant where I live, is that it has a tantalizing habit of blooming so late that it is usually destroyed by frost. *Datura meteloides* was used by the rain priests of certain Indian tribes, who gave the powdered roots to patients to induce sleep and help them to see ghosts.

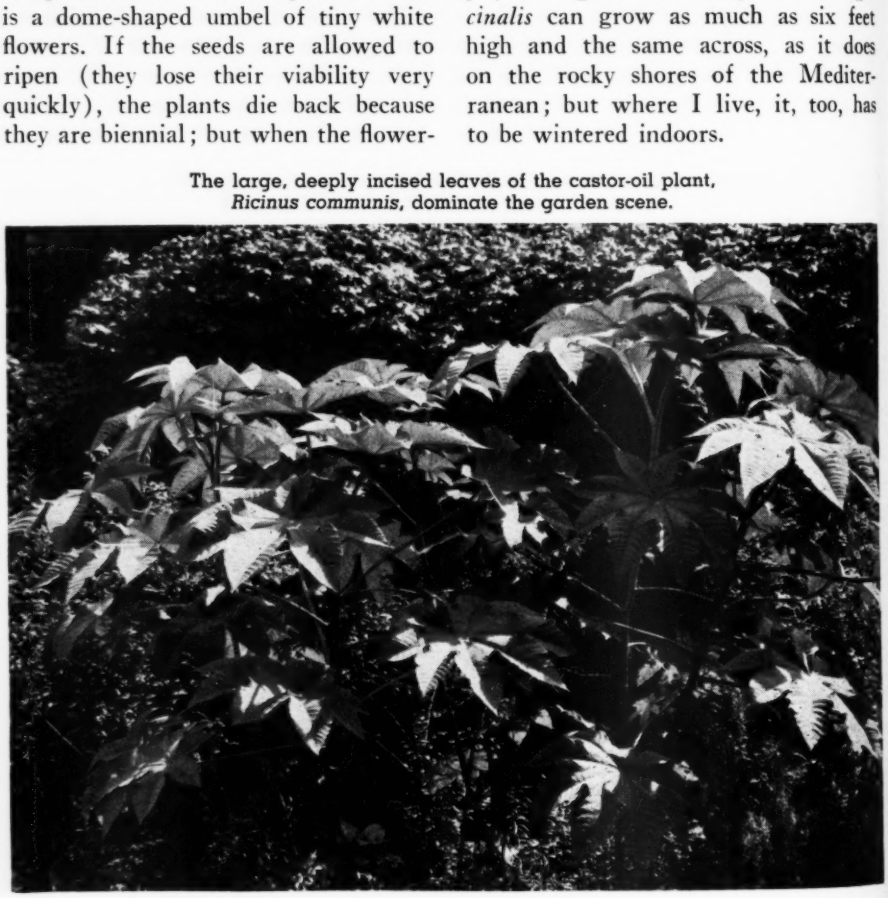
Lovage, *Levisticum officinale*, resembles celery in looks and taste. The leaves are compounded in threes and coarsely toothed; the inconspicuous greenish yellow flowers grow in compound umbels, typical of the parsley family to which it belongs. This tall perennial from the herb garden seems to prefer a shaded situation.

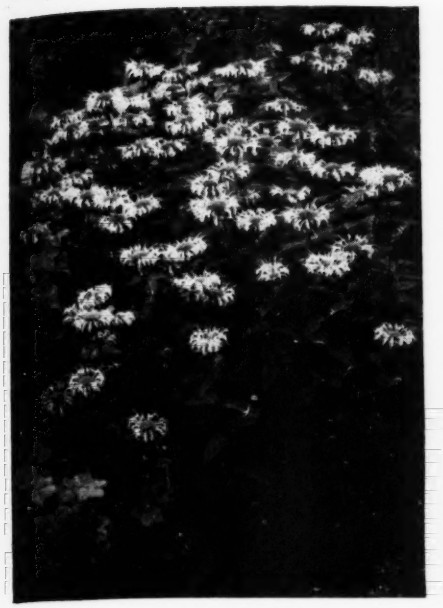
Also of the parsley family is *Angelica archangelica*, which sometimes raises its hollow, upright stems to six feet. At their bases are huge, pointed and toothed, compound leaves. At the apex of a stem is a dome-shaped umbel of tiny white flowers. If the seeds are allowed to ripen (they lose their viability very quickly), the plants die back because they are biennial; but when the flowering portion of the stem is cut off before the blossoms begin to form, the plants sometimes last for another year. The stems are candied, and the leaves provide a pleasant flavor to mild drinks, such as lemonade. To prepare them, I let the leaves soak in hot syrup and lift them out as soon as they begin to turn brown. Then I let the liquid cool and add it to the fruit juice just before serving the refreshing drink.

The cut-leaved tansy, *Tanacetum vulgare* var. *crispum*, of the Composite Family has much divided, crinkly foliage. As with other members of the genus, it carries its small, tight, yellow flowerheads in flat-topped cymes. Tansy, which has a strong odor, has been used medicinally.

Perhaps the handsomest and most fragrant plants in the herb garden are the tall lavenders, such as *Lavandula officinalis* and *L. stoechas*. Neither, alas! is hardy in my garden. However, they are so lovely with their upright spires of lavender bloom—*L. stoechas* has tufts of violet leaflets at the tips of its spires—that I winter them indoors to keep them alive. Their winter resort can be a heated garage, a sun-heated pit, or a glass-enclosed porch. *L. officinalis* can grow as much as six feet high and the same across, as it does on the rocky shores of the Mediterranean; but where I live, it, too, has to be wintered indoors.

The large, deeply incised leaves of the castor-oil plant, *Ricinus communis*, dominate the garden scene.





Beebalm, *Monarda didyma*.

Lavender borders this bed in the author's herb garden; clary sage is in flower, and elderberry blooms in the background.

A colorful biennial and member of the mustard family is *Isatis glauca*. Woad is welcome because it blooms in May — most herbs do not begin to flower until mid-June. The leaves are glaucous, as are the stems which rise to three feet or more and bear panicles of fluffy yellow bloom, followed by clusters of flat, almost black seeds. If the stems are cut back after blooming, the plants continue to flower on and off into July. This is the plant that furnished the dye used by early Britons to color themselves blue, as reported by Caesar. They prepared the leaves for dyeing by a complicated process of fermentation. Later, it was the medium for coloring cloth for the uniforms of the British navy.

Not particularly handsome but unusual looking is *Cassia marilandica*, a yellow-flowered, four-foot high perennial of the Pea Family that blooms in mid-July. It is native to eastern United States, where it is found in marshes and moist meadows; but it does so well in my garden that I have to cut it back before the seeds ripen to prevent them from invading the whole premise. The leaves are about eight inches long and three across. They are pinnately divided into from twelve to twenty leaflets, which fold inwards as soon as they are touched and remain folded after being brought indoors. The yellow pea-shaped flowers are crowded into a loose pyramid at the top of tall, erect stems. The four-inch long seed pods are flat and winged and hang gracefully from the stems. Early American doctor-botanists had hoped the plant would have the same constituents as the cassias from Africa and India that furnish cathartics, but the leaves of American senna proved to be only mildly purgative. Nevertheless, they were used as medicine by the Shakers.

In July, the herb garden is pleasantly and strongly scented by the small white panicles of garden heliotrope, *Valeriana officinalis*. The plant grows five feet high and has pinnately divided leaves. The medicine called "valerian," which comes from the roots, is used today principally to provide an agreeable flavor to sedatives. The plant is a vigorous spreader.

Most artemisias are not tall except mugwort, *Artemisia vulgaris*, which is widely used to make a moxa, a small combustible mass to burn the skin. But it is too weedy and not good-looking enough for the herb garden. A plant very similar to it is *A. lactiflora*. This, with creamy spires of bloom, is highly decorative, but it is not a herb (not mentioned in the pharmacopoeia); neither is *A. ludoviciana* var. *gnaphaloides* with very grey stalks, four to five feet high, clothed with equally grey foliage. Even though this has not flowered for me, it is attractive in the garden.

The mulleins, *Verbascum thapsus* and others, are European and Asiatic weeds naturalized in the United States. Their leaves have been used extensively for various complaints, as they are demulcent. Many people, particularly the English, like mulleins in their flower gardens because of the six-foot high columnar stems, like exclamation points, that bear narrow spires of yellow flowers at the apices. They also like the woolly texture of the leaves. There are large basal leaves that form a rosette and smaller leaves that clasp the stems.

Other plants valued for their demulcent virtues, but this time derived

from the roots, is hollyhock, *Althea rosea*, from China and marsh-mallow, *A. officinalis*. The latter, which originally came from Europe, embellishes our swamps with its huge rose, white, or red, cup-shaped flowers. When the hollyhock is permitted to rise to eight feet or more, it is too high and thin to be grown with other herbs; but if the main stalk is cut back when it reaches two feet, side branches will form, and the plant will develop a colorful, bushy growth.

Besides hollyhocks other handsome herbs come from the flower garden; among them is the foxglove, *Digitalis purpurea*, a biennial. The entire plant is softly hairy, and it demands a well-drained, somewhat shaded situation. If allowed to self-sow, *D. purpurea* will spread freely. The first year it produces only basal leaves. During the second summer, the stems will rise to four feet and bear nodding, two-lipped flowers on one side of the upper portion of the stem. If the central stem is cut back after it has finished blooming, new flowering stalks will grow out from the base and extend the bloom through most of the summer. These secondary bloomers, however, are not as striking as the first pyramid. Though called *purpurea*, there are color variations in pink, cream, and darker shades. One variety, 'Isabellina', has pale yellow flowers.

The drug, digitalis, processed from the dried leaves of *D. purpurea* is a well-known heart stimulant which has been administered since earliest times.

Helenium autumnale is a tall, native American perennial; it is known as sneezewort, wild sunflower, and false sunflower. Its rough, branching stems bear ternate, lanceolate, toothed leaves and terminal heads of yellow daisy-like flowers. As might be expected from its popular name, it is a strong irritant to the mucous membranes and causes sneezing. In the garden, the plants grow sometimes to six feet high; they bloom late in summer.

It is thought the name aconite was derived from the Black Sea port Aconis, while *napellus*, meaning "little turnip," describes the thickened tuberous roots, the portions used medicinally, of *Aconitum napellus*. The leaves of this aconite are palmate. The four-foot high stem bears spires of blue and violet flowers, which are the last to appear in the garden and furnish a dark accompaniment to the grey leaves of the herbs.

It was the Chinese who long ago first used aconites medicinally, as did certain hill tribes of India. The drug was introduced into Europe at Vienna in 1763; its function is to quiet overactivity of the heart.

Often, when I walk along country roads, across fields, or through woods and recognize medicinal plants, I wonder how their virtues first came to be known. Did man learn from watching the animals, or did he gain knowledge by trial and error? Maybe there was a little of both. Many herbs, such as chicory, *Cichorium intybus*, have a bitter taste. It is thought that in early days this characteristic might have been considered indicative of medicinal virtues. In *C. intybus*, the medicinal value is slight — the dispensatory says the roots are used as a mild tonic. But they provide a black and bitter drink popular in France, where it is often mixed with coffee — a drink which I happen to like, though it is regarded disdainfully by most Americans.

American senna, *Cassia marilandica*.

The roots of chicory are also dug up and planted in coldframes, where the young shoots are bleached to produce endive. Most of our edible endive comes from Belgium.

According to my experience, chicory is biennial, but some authorities say it is perennial. A native of Europe, it has spread along roadsides and meadows here. The stem grows to six feet high; the leaves are puckered along the central vein and indented on the margins. The flowers, which close at noon, form a head of strap-shaped florets usually light blue; sometimes, as in the northern part of the state, they are a deep blue. There are also white and pink variants.

In July the deep woods near where I live are lightened by tall white spires, composed of little flowers atop stems that rise eight feet high. These are the spires of *Cimicifuga racemosa*, commonly called black snake-root or black cohosh. The white spires look ghostly amid the dark green of the woods and have a disagreeable odor. The leaves are three-divided and incised. The rhizome-like roots furnish a bitter tonic and other medicinal concoctions.

For years I have bought woodland plants for shaded portions of my garden from E. C. Robbins of North Carolina, who has written me that I am his "longest" customer — tactfully, he did not say "oldest." In his catalog, I found *Aralia racemosa*, American spikenard, also called life-of-man and Pettymorrel. The spikenard is perennial, grows to six feet high, and has large three-divided leaves. The umbels of small white flowers form a terminal panicle and are followed by brown-purple, berry-like fruits of a pleasant aromatic flavor. The root and green of this plant are ingredients of root-beer. Fernald and Kinsey in their book, *Edible Wild Plants*, quote Dr. Huron H. Smith as writing that the Menominee Indians cooked the roots with wild onions, gooseberries, and sugar, and the result was very good. Jelly has also been made from the fruits.

In Mr. Robbins' catalog, I also found *Collinsia canadensis*, called horse-balm, horse-weed, and stone-root. This is a deliciously fragrant, five-foot high perennial of the Mint Family. It has large, coarsely toothed leaves and spreading panicles closely covered with yellow flowers, redolent of lemon. The dispensatory says the odor is strong and disagreeable, a slight difference of opinion, and that the plant was a folk remedy. I planted collinsia in the woods, and the deer ate every bit of it right down to the ground.

In late summer, the fields in parts of the United States turn into a riotously colored flower garden. There are meadows filled with milkweeds in orange,

(Continued on page 73)

This lawn has been developed from a mixture of quality grasses based upon an improved red fescue.

QUALITY LAWN SEED

By **Robert W. Schery**

Dr. Schery is Director of the Lawn Institute, Marysville, Ohio.

THESE THREE unsophisticated, familiar words, "Quality Lawn Seed" would at first glance seem simple to define, be a subject quickly disposed of. But "quality" is not a simple have or have-not state, for there are several aspects to quality. Consider that:

Quality (in lawn seed) reflects (1) the mechanical attributes of seed cleanliness, such as freedom from weeds, from chaff, from other seeds or impurities, and from breakage or cracked seeds which might deteriorate; (2) biological considerations, such as the genetic make-up of the seed, its viability or ability to germinate, abundance of food reserves, and physiological balance to yield a vigorous seedling; and (3) decisions of human beings, such as whether proper grasses are chosen for living together well in the lawn, whether the species chosen are suited to the climate and for the use to which they will be put, and whether the lawnsman will plant and care for the grass adequately. Then there is an added semantic complication. Any seed used to make a lawn is a "lawn seed," although usually grass seeds are chosen. Whether a given grass be acceptable for a lawn depends again upon human whim, and upon climate, soil, and care. Indeed, quality in lawn seed is not so uncomplicated, as it might first seem!

Fortunately, procedures and ethics of the trade, laws regulating seed commerce, and responsibility felt for well-known brands, simplify the task of determining what is quality lawn seed. For reasonable assurance a consumer need know only the few grasses that are the proven performers for his climate and conditions. He then can look to the ingredient listing required on the box or sack, to see if the star performers constitute most (if not all) of the mixture. North from Tennessee these are especially the Kentucky bluegrasses and the Oregon red fescue varieties (Chewings, Illahee, Pennlawn, Rainier); in the South, Bermuda is the chief permanent grass seeded (there is much vegetative planting of lawns in the South, i.e., sprigging and plugging for grass starts; or temporary winter seedings of ryegrass).

Along with the required composition listing on the seed box are figures for germination percentage, weed content, for "crop" (other non-weed seed), and so forth. Conventional trade standards and the seed laws pretty well assure that these meet consumer needs. Of course, top mixtures will probably be cleaned up to a higher "purity" (less chaff and extraneous seeds) than lesser stuff, and thus represent a superior value. The cleaner the seed (that is, the higher the purity) the more likely it is to contain plump, heavy seeds which are fast, vigorous sprouters.

No one will intentionally plant weeds in his lawn, and no reliable seedhouse allows consequential amounts in its lawn seed. Weed seed inadvertently harvested along with the grass is mostly eliminated by the intricate series of blowings, screenings, and separation procedures to which seed is normally subjected. Only very small weed percentages are permissible in seed marketed through regular trade channels, and in most states species especially harmful (noxious) are not allowed at all. Lawn seed procured through reliable sources is so nearly weed-free that there is no danger of a weed problem in lawns. However, dormant weed

Mature seedheads of well-tended lawn fescues have been cut, bound, and left to cure for a few days in this Oregon field.

seeds do infest almost all soils and are a frequent cause why weeds are blamed on the sown seed. The infinitesimal traces of weed seeds which might get through to the retail mixture are, moreover, mostly agricultural species which die out in a mowed lawn.

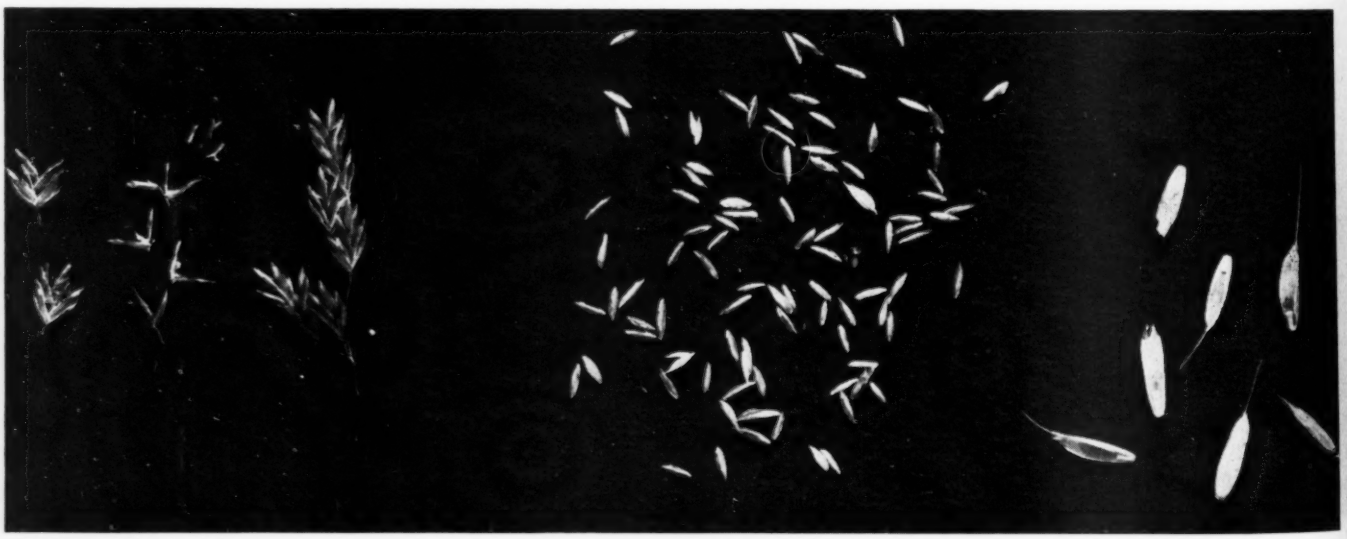
Biological factors bearing on lawn mixtures are much more involved than is the clear-cut achievement of good mechanical quality, and subject to varying opinion. Agriculturists have traditionally bred crop varieties for genetic purity, so that all plants are identical, become harvestable at the same time, and have like handling and keeping qualities. This rigid uniformity is not needed in a lawn, where the goal is simply green leafage, and the mower becomes the great guardian enforcing uniform appearance. Indeed, a number of experts believe that species with less uniform, mixed heredity are best suited for colonizing the diverse sub-environments found in any lawn (for example, sun-shade, dry-wet, fertilized-unfertilized, close-high clipped). This is one good argument for choosing natural Kentucky bluegrass (harvested from fields having many "strains," which have been in existence and subject to natural selection, some since Colonial times). It is also the reason why skillful seedsmen blend species or varieties into seed mixtures, as by adding one or more of the Oregon fescue varieties to bluegrass; there are then even more candidate grass types to satisfy the myriad of micro-climates a lawn possesses, or differing schemes of lawn care may impose.

Of course, a seedsman could go too far—by mixing in coarse haygrasses which will eventually become unsightly, or by including stifling quantities of impermanent "quick-show" species such as ryegrass and redtop. It is at this point that the consumer must protect himself, by checking the ingredient listing on the seed package. In ordinary usage a mixture should contain at least eighty per cent fine-textured, perennial grasses for the climate in which grown —such as the bluegrasses and lawn fescues mentioned for northern regions.

There are many subtle biological influences still little studied for lawn grasses. For example, what influence may seed treatment have upon the mature plant, and how does a plant's physiological state affect what is commonly diagnosed as disease? We do know from experience that certain species get along well together in the lawn. Red fescues and bluegrasses have the same general growth habit, can survive shoulder-to-shoulder in the lawn, even though their fertility and shade tolerances may differ slightly. Introduce bentgrass, however, and other lawn grasses do not survive in the patches colonized by the bent. Is this due to "smothering," an antibiotic influence, merely because bent grows on the more acid and wet soils not so suitable to other species, or what? Good blends from experienced seedsmen take these known effects into consideration, even if the causes are still obscure.

(Continued on page 67)

Bluegrass panicle and dissected spikelets at left; mature bluegrass seeds resulting from maturation of spikelets in center; coarse rye-grass seeds at right for comparison of size, indicating that there are fewer "potential plants" in a pound of rye-grass than in a pound of bluegrass blend.

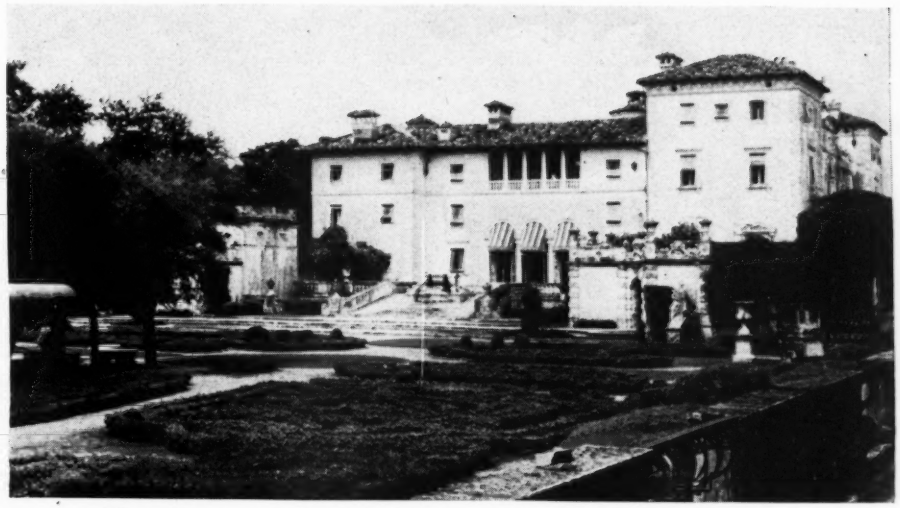


VIZCAYA—

An Italian Palazzo in Miami

By Howard W. Swift

Mr. Swift is Assistant Curator of Education at The New York Botanical Garden.



The residence, now the Dade County Art Museum, houses a vast store of European art treasures.

IN GREAT CONTRAST to homes and gardens in compact, modern design — functional, keyed to efficient and unhampered activity—here is Vizcaya.

From the hurried, tense atmosphere of crowded streets in the business section of Miami, it is a pleasant drive through tree-shaded avenues to the home of the late James Deering, which is now the Dade County Art Museum. Even its name Vizcaya (after Spain's Province of Biscay) has a rather romantic connotation.

The gates, in keeping with the estate, are constructed of wrought-iron in elaborate Italian design and mounted with a crest combining an old Spanish ship, the "Caraval Vizcaya," two sea horses, and fronds of palms. In the supporting structure, the native limestone is first noted. This stone has been used for buildings and for many of the garden features at Vizcaya. It is very porous and in this moist, subtropical climate soon becomes weathered and quite aged in appearance.

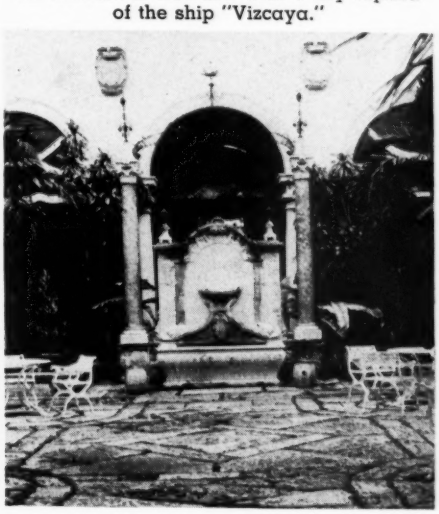
Once inside the gates, we may choose either a shady woodland path or a winding drive to the palace. The crowded growth of native trees, shrubs, and vines allows only glints of bright sunshine to penetrate. The thick foliage may still be dripping after a quick shower, causing heavier leaves to rustle rather than float to the ground. The occasional sharp voice of a bird may be startling when suddenly heard from the high branches. We can scarcely fail to sense the penetrating roots, the struggle for nourishment so typical in Florida "hammocks." All thought of the busy city is quickly dismissed.

Suddenly the sound of splashing water breaks the quietness. This sound arises from streams which slide from basin to basin in a water-course. Steps flank the water-course and descend to a small but stately courtyard at the entrance to the palace. A vivid imagination conceived this sumptuous Baroque dwelling as a permanent home to accommodate the priceless art treasures ardently collected by Mr. Deering in his extensive traveling. An imagination even more vivid conceived the sprawling formal and informal gardens which were developed out of mangrove swamps. How soon the mangrove trees would take over these gardens if the land were left uncared-for and unprotected!

At least an hour or two should be allowed to concentrate on the richness and elegance of the Museum. The splendor of period rooms eloquently reflects French, Spanish, and Italian culture. Everywhere there is work of painstaking craftsmen who have left no

Massive colonnades frame the inner patio.

Its fountain is crowned with a tiny replica of the ship "Vizcaya."



Cuban tiles and heavy accesories are in keeping with the sturdy pillars.

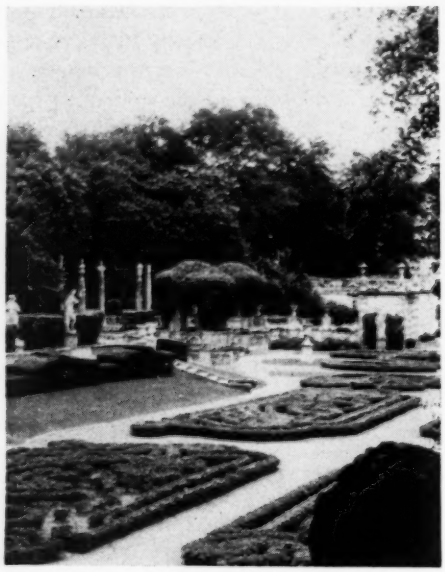
names behind in the archives of the great. The Oriental influence, frequently encountered in this atmosphere of old Europe, was very popular at the end of the nineteenth century.

After we have enjoyed a few first-floor rooms imbued with the tradition of other eras, it is refreshing to step outside through an arcade with bold Italian Renaissance arches and columns and then into the sun-drenched courtyard. The central feature here is a seventeenth-century Italian dolphin fountain with marble basin, above which is a lacy wrought-iron support for the little ship "Vizcaya." The pineapples, used in the ornate fountain design, are a symbol of hospitality.

Then there are upper rooms to see. These rooms for daily use are more livable, but surely not lacking in elegance—especially the bathroom! From the delightful upstairs dining room there is an excellent view of the broad formal garden, which is terminated by a small casino.

An ancient Roman sarcophagus is utilized for the basin of a central fountain.

A formal parterre garden of this extent is rare in America.



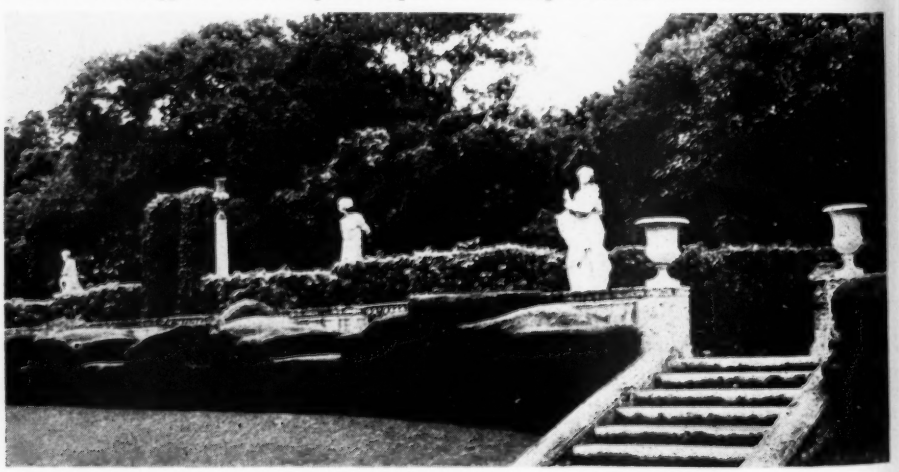
Again on the first floor, and another pause in the courtyard before we continue to the south terrace through tall gates which actually determined the height of the second floor.

Outside, the spaciousness of the rambling gardens and the bold pattern of the stone flagging are impressive. The fountain directly ahead has a Roman sarcophagus for a basin and is elaborated with lead lizards and frogs. Playing jets of water give it life.

By a short detour to the Biscayne Bay side of the Museum, we find a sheltered sea-entrance where yachts could anchor and a broad sea-scape. A very elaborate stone "barge" with sculp-

The water stairway has potted Australian-pines on either side.

Raised walks, typical of Italian gardens, provide a setting for statues and elaborate ornaments.



Left. The charming theater garden.

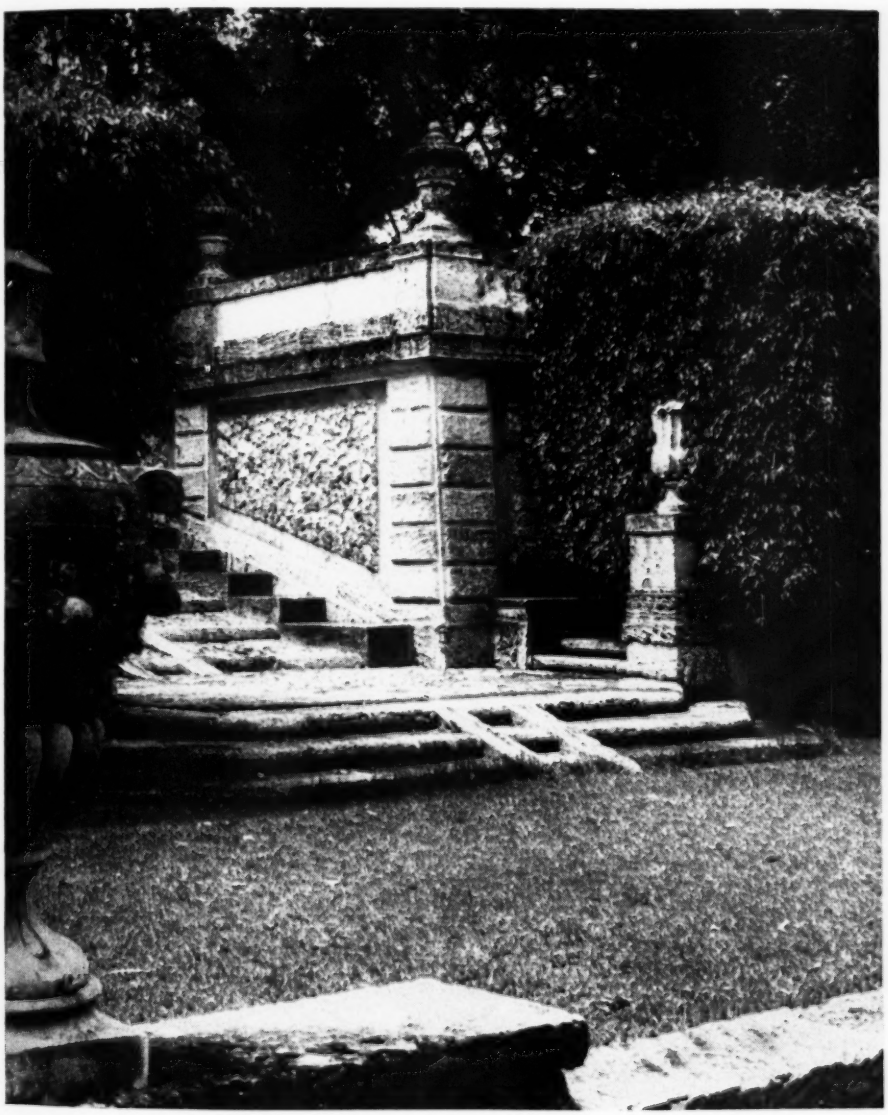
Right. Peacock bridge in a far corner of the grounds.

tures symbolizing delights and terrors of the sea offers protection for small craft. Slim obelisks rise from this pile of stone which is frequently pointed out to tourists who pass by on cruise boats from Bay Front Park in Miami.

Back then to the formal garden with its fanciful bedding. It is surprising that there can be so much grandeur without the use of bright color—a great parterre design, like embroidery. Few such gardens exist on this side of the Atlantic. A large raised pool, with clipped live-oaks on either side, focuses the attention. Live-oaks we generally think of as great, wide trees—like those on the higher terrace beyond—not as trees so severely trained. The raised walks left and right are typical of Italian gardens, where the natural terrain is very different from that of Miami. They pleasantly relieve the monotony of level land. These terraced walks are set apart by clipped hedges of Australian-pine (*Casuarina*) and afford a fine setting for white stone figures of gods, goddesses, and mythological creatures

Stairway leading from the casino to the Venetian boat landing.

These steps, with integrated ramp to accommodate garden carts, lead up to the casino.



wrought mostly in Italy during the seventeenth and eighteenth centuries.

A water stairway terminates the central vista. Its water falls over the edges of the pools, and at the same time energetic streams of water are thrown upward from pool to pool. On landings of the staircase, Australian-pine has again been used—this time as severely clipped trees in large jardinieres. It is interesting to find that this plant from the southern hemisphere is so widely exploited in Florida and the Caribbean Islands, both as a decorative and a naturalized plant. Through the Florida Keys it is one of the common

One of the many mythological creatures represented in stone throughout the garden.

trees, and certainly it has the appearance of belonging there.

From the raised walk along the left side of the large formal garden there are entrances to several small, secluded gardens. One is like a little theater, patterned in miniature after a garden of the Villa Gori near Sienna. It has stage wings (again of clipped Australian-pine) and was obviously not created for live performances. It is not difficult, however, to picture an eighteenth-century garden party in such a charming setting. Greens of turf and hedges, with only the brightness of gay little figures, are very refreshing. Other intimate gardens are arranged in sequence. The last is an intriguing water garden with a massive central feature, Baroque in style, that once supplied water to the town of Bassani di Sutri, near Rome. Narrow canals radiate outward and reflect colorful annual flowers.

Leaving the fountain garden, one arrives at Peacock Bridge, magnificently set off by twisted entrance columns decorated with proud peacocks. The bridge rises in a high arch and is referred to as the "O" bridge, because its reflection in the water produces a perfect oval.

Who can resist stopping to admire the high clipped hedges and the well-proportioned stairway in ascending the man-made hill where the casino is situated? The narrow ramp is made to accommodate wheeled garden trucks.

Finally, there is the casino itself. This small classical building, set as a jewel in its great garden, must have served as a pleasant retreat for quiet conversation or for tea. Its main attraction is the frescoed ceiling with a border which came from the studio of that great Venetian painter, Tiepolo.

Guests must have frequently departed from Vizcaya by the solid stone stairway which descends to the Venetian water landing, gay with brilliantly painted gondola baulks. And by this way we also take our leave.

PLANT COLLECTING (from page 49)

tied to a palm. But, how could it be? Neither Chambers nor I could believe our eyes at first; but there, safe and sound, covered with plasticos and tarpaulins lay our gear in the piraguas. All night, while we slept, our river-wise men had been awake in spells, guarding our precious cargo, bailing, shifting the "tarps," re-mooring the piraguas to protect them from the fate of others now being flung about in the river. Needless to say, we were very grateful to those Darien men for saving our collections. For this one act, we could forgive all the foolish and irritating things they might ever do.

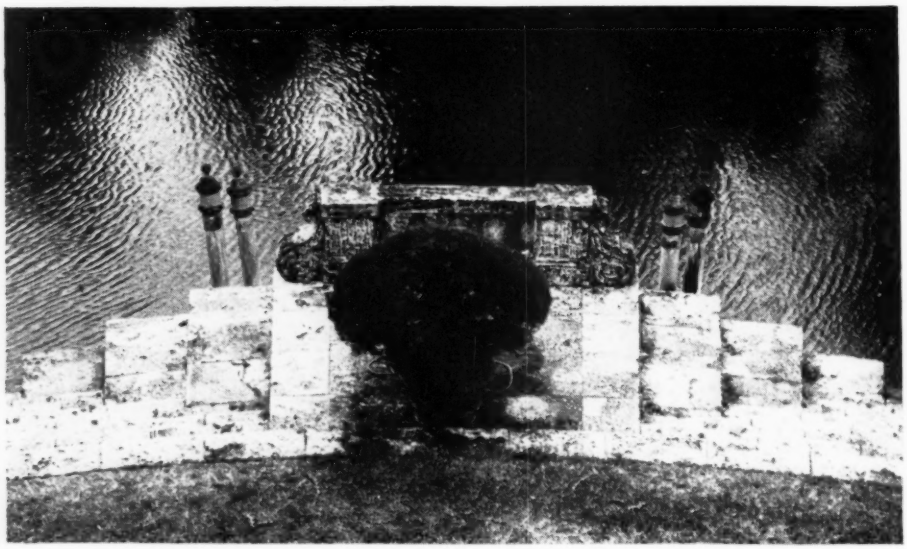
It is difficult at this writing to evaluate intelligently our collections. Certainly there will be records of plants first collected in this area; some of our material will doubtless represent species new to science; some of our material will provide more and better research material for botanists in years to come. All told we gathered over one thousand plant species from El Darién in sets of six for distribution to botanical institutions in Europe and the United States. Between six hundred and seven hundred wood specimens were collected, which will serve as the basis for research in plant anatomy. Professor Chambers obtained flower buds from one hundred and fifty plants, many from plant families heretofore unknown cytologically.

This trip is but the forerunner of others to come. Certain areas should be collected more intensively than was possible this time. The "bank above the Río Paca" deserves a long look—a deluge of rain and short supplies prevented our doing so on this trip. A different season of the year will produce new blooms and new collections. The coast of Darien near Bahia de Piñas and Ensenada Guayabo should be explored, as well as the Serrania del Sapo. Cerro Tacarcuna, near the Colombian border, is sixty-one hundred feet high; its fastnesses should be examined for new plants.

I recall one soggy evening after tramping several hours in the rain. We had eaten and dried off as best we could; our hammocks, still wet from last night's rain, had been slung. We crawled between our dampish, moldy-smelling blankets, shrank from the discomfort of them against our skin, closed our mosquito netting, and swatted at the mosquitoes that had been trapped in with us. I mumbled that any damned fool who would undergo these privations for a few miserable dried plants, some moldy wood specimens, and pickled buds, must be out of his mind or near to it. But I think I can speak for the four of us in saying we would do it all over again.

Given the opportunity, I am sure we shall.

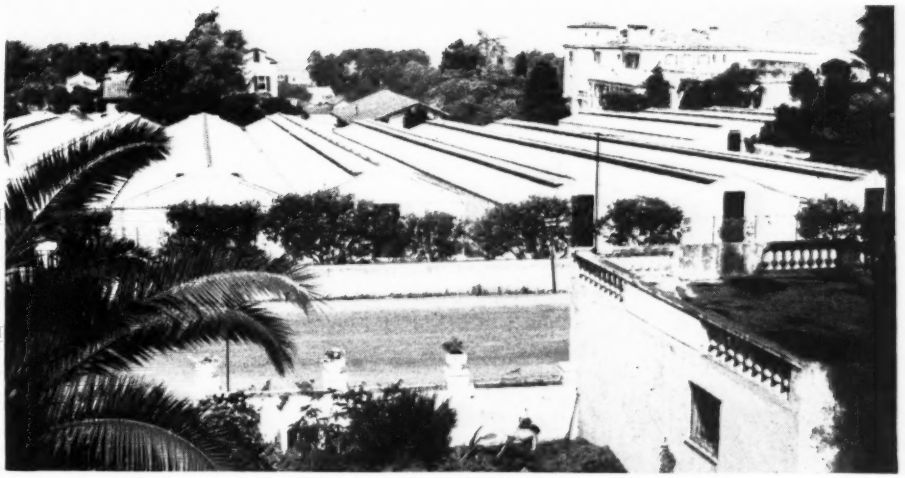
Venetian boat landing with gaily colored baulks. Picture taken from the casino.



MEILLAND ROSE ESTABLISHMENT

By **Alice Dustan Kollar**

Alice Dustan (Mrs. Samuel) Kollar is garden consultant, author and lecturer. Mrs. Kollar edits the garden page of *The Newark Star-Ledger* and conducts garden workshops.



The extensive greenhouse range of the Meilland rose establishment, photographed from the balcony of Hotel Beau Site.

IT WAS OUR good fortune last summer to visit the world-famous Meilland rose establishment in its magnificent setting at Cap d'Antibes. This is a point of land jutting into the Mediterranean between Cannes and Monte Carlo. Perhaps readers of *The Garden Journal* will be interested in the accompanying pictures, as André de Vilmorin referred to the Meillands in his interesting paper, "Some French Plant Breeders and their Work in Horticulture," which was published in the January-February 1960 issue.

The beautiful wrought iron gate is open to visitors to the Meilland rose establishment.

After we had passed through the beautiful wrought iron gates at the entrance, we came upon the plantings of mimosa, the southern magnolia (*M. grandiflora*), the rubber-plant (*Ficus elastica*), palms in variety, and orange trees in fruit which surround the residence.

Beyond the Meilland family's charming home is an extensive range of greenhouses and a sparkling white stucco structure with red tile roof, so characteristic of that part of France. This proved to be the administration building of this rose-breeding establishment. Masses of white daisies and pink geraniums filled beds adjacent to it.

Just as my husband was about to ring the bell, a tall, bearded man came out with a dark-haired, little lady. We assumed her to be Mrs. Francis Meilland, widow of the renowned rose hybridizer who had passed away last year. And we were right in so assuming, as we learned when the gentleman introduced her and then gave his name, Harry Wheatcroft. (He is a member of the Wheatcroft Nursery of England, which introduces Meilland roses into that country.)

As Mrs. Meilland does not speak English, and neither her father-in-law, "Papa" Meilland, nor her son Alain were available, Mr. Wheatcroft offered to give us a quick tour. When we started, I noticed small white caps on the branch tips of several rose bushes that had been pollinated. These coverings ward off bees and other agents

that might interfere with the plant-breeding procedures.

Mr. Wheatcroft opened the door of the first greenhouse, and we had a breath-taking view of thousands of roses in many colors. Most of the Meilland roses are grown under glass in clean sand and fed by chemical culture. There are ninety thousand to one hundred thousand rose plants in the greenhouses

White caps cover the branch tips on pollinated rose bushes.

and outdoor beds, which occupy a few acres of the fabulous vacationland on the French Riviera. From these plants, about a dozen promising new cultivars are selected over a period of three years for serious consideration. This dozen, after being carefully tested and scrutinized in trial gardens in different parts of the world, is narrowed to three or four varieties. Only then do Meilland rose originations go into production elsewhere and eventually make their debut.

Four roses, originated by the late Francis Meilland, have been recently sent to American gardeners. Two of these are Floribundas, 'Sarabande' and 'Fire King', and both are All-American Rose Selections for 1960. 'Fire King' was attractively arranged in a vase in the lobby of the small hotel just across the street from the Meilland establishment. We admired the way its irridescent vermillion blooms blended with the touches of red in the otherwise cool-looking room which had white walls and dark furniture.

The two other Meilland roses being introduced are 'Golden Girl', a vigorous and shapely Grandiflora, and 'Royal Velvet'. The ruby color of the latter is stunning, its texture really velvety, and the large flowers are freely produced on a strong, tall plant. Some one counted sixty-five petals to one flower—just to give an idea of its size and fullness.

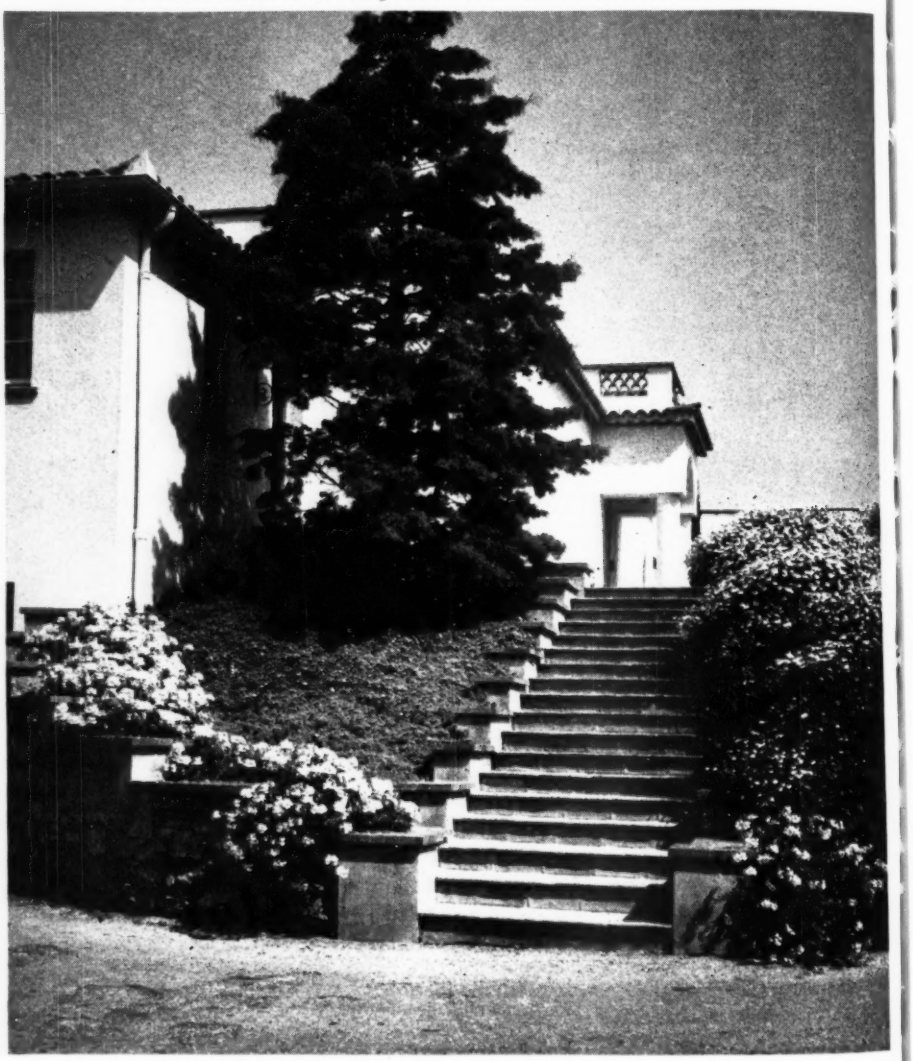
It was truly a rewarding experience to visit this place that concentrates on developing new roses, to see something of the great care and infinite patience which are part of rose hybridization, and to feel some of the pride which the Meillands justly have in their rose creations. After all, ten years elapse from the seeding of a rose to the time of its introduction as a worthy new variety.

TULIPOMANIA (from page 43)

Escherichia coli also can be of some potential ecological value, since the ability to produce the enzyme would be essential for multiplication in certain metabolic environments. Of greater practical influence is the transduction of somatic (O) antigens and probably of other virulence factors in Enterobacteriacea. It can hardly be doubted that the pathogenic behavior of these bacteria is profoundly affected by their ability to acquire new immunological characteristics as a result of infection with the proper kind of bacteriophage.

It will be noted that, in the examples of bacteria-bacteriophage relationships quoted above, the biological advantage accruing from infection could become manifest only under special environmental circumstances. This limitation probably accounts for the failure to recognize that other viruses may also

The administration building of the world-famous rose establishment.



exert beneficial effects on their host cells. In general, the techniques used by the virologist are designed to demonstrate pathogenic effects and almost by necessity therefore fail to detect beneficial relationships. The beneficial role of nodule bacteria in legumes was detected by growing these plants in soil or in media deficient in nitrogen. Legumes do not need the bacteria if soluble nitrogenous compounds are readily available, and moreover they can be killed by the infection under certain circumstances.

Since beneficial relationships become manifest only in specialized ecological situations, the proof of their existence in viral infections will require the development of new techniques and new test conditions. It will be necessary, furthermore, to introduce broader criteria for evaluating the outcome of the virus-host relationships. One of the reasons why virologists do not accept that the variegation caused by viruses constitutes a characteristic with survival value is that they regard as valid only those criteria that are measurable by laboratory operations. Esthetic and emotional reactions certainly play a role as determinants of biological success, but they have not gained a place among scientific parameters, because they cannot be readily measured. Nitrogen fixation can be measured, and for this reason infection of the sweet pea by nodule bacteria is regarded as symbiosis; if the effect of infection were merely to improve the fragrance or appearance of the flower, it would be regarded as disease.

It is true that human tastes change, but they do not always change for the better. Masses of healthy tulips, all of the same color and size and arranged in rows like soldiers, do not necessarily constitute more desirable achievements than the virus-infected specimens lovingly portrayed by the seventeenth-century painters. Pink or bronzed, the burly men and women in the health camps of political parties may not be the finest flowering of the human race.

It is probable that viral infections prevent the Zomerschoon tulip and the variegated abutilon from achieving their maximum potential size. But size is not a very significant criterion of success. By making the infected specimens of tulips and abutilon more interesting individuals, the viruses have given them a biological advantage that encouraged their spread. If we choose to call a process, which has carried these lovely plants all over the world and enriched thereby the life of men both literally and figuratively, a disease, then it follows that civilization certainly owes much to disease—for the most interesting and most creative individuals are not necessarily the healthiest members of the species.

FLORIADE (from page 53)

other publications of The New York Botanical Garden, *Addisonia, Brittonia, Economic Botany, Memoirs of The New York Botanical Garden,* and *North American Flora,* will be on display.

Retail Garden Center

How the average U.S. gardening family shops for garden supplies will be demonstrated through a retail garden center. Stocked with merchandise to meet virtually every garden need—from chemicals, seeds, hand tools, power equipment to garden clothing—the exhibit will depict the uniquely American self-service garden supply store.

Exhibit Pavilion

Educational displays by governmental and horticultural organizations will be housed in a special pavilion. Among these are a roof-top garden, typifying urban gardening activity, by the New York Horticultural Society; experiments with plant growth, using artificial light stimulation, by the Men's Garden Club of New York; and the renowned Blue Star Highway project by the National Council of State Garden Clubs.

In vivid variety and contrast are displays by the University of Arizona's Laboratory of Tree-Ring Research and the National Geographic Society on the forty-six hundred year old bristlecone pine, the world's oldest living material; by the Atomic Energy Commission on how atomic research contributes to man's knowledge of plant functions; by the General Motors Tech Center and Connecticut General Life Insurance Co. on the part played in modern American architecture by landscaping.

In addition are displays by Rockefeller Center on horticulture in a major business center; by The Bailey Horatorium of Cornell University; by the Oregon Cactus Society; and by the Pennsylvania Horticultural Society on the sunflower in American Indian rituals.

Your Participation

If you're planning a trip abroad, don't fail to visit the Floriade. Whether or not you personally attend this superb exposition, it is worth considering that you can participate in your country's display of its horticultural accomplishments by sending a donation, however, small, to the U.S. Exhibits Committee of American Horticultural Council.

QUALITY SEED (from page 60)

Top-quality seed mixtures usually have almost all chaff cleaned out. In the process most light-weight seed is also blown off. Research studies have shown that plump, heavy seeds sprout more quickly and grow more rapidly into stouter seedlings than do light seeds. This is another hidden advantage in buying top-quality seed. Inasmuch as the greatest expense in seeding a lawn is for labor to prepare the seedbed, it pays to sow seed that will most certainly make a stand ahead of the weeds. Once the main investment is undertaken, budgeting a few cents more for purchase of only the best seed is being practical rather than extravagant.

Seed more expensive by the pound is not necessarily less economical! Certainly cheap haygrass mixtures are worse than worthless at any price, for in using them one is planting difficult-to-eliminate "weeds." Even medium-grade mixtures containing a lot of nursegrass, although less expensive by the pound, will probably have fewer seeds (potential plants) in that pound than a mix predominately bluegrass – red fescue; bluegrass has over two million seeds to the pound, ryegrass only one quarter of a million.

How to plant and care for a lawn, and keep the weeds out, will have to be the subject of a separate discussion. In planting a lawn remember, however, that unless one starts with quality seed all else will likely be in vain. It is quite possible to "do things wrong," so as to fail to exact full potentiality from quality seed; but you can never "do things right" enough with a poor seed mixture, so as to catalyze it into a top-flight lawn.

A "FOSSIL" LETTER
from T. D. A. COCKERELL
to P. A. RYDBERG

By Herman F. Becker

Dr. Becker is Visiting Research Associate at The New York Botanical Garden.

IN REVIEWING the genus *Rosa* at The New York Botanical Garden Herbarium, Dr. Arthur Cronquist, Curator, called my attention to a letter dated August 20, 1910, from Theodore D. A. Cockerell to Per Axel Rydberg. It was pinned to a herbarium sheet together with a small, spiny stem of a rose. Subsequently a second letter was discovered, also from Cockerell to Rydberg, and dated June 26, 1912.

After fifty years or more, men known for their achievements often become legendary to following generations. Biographies are not always written, and the "American Men of Science" reveal only an abbreviated glimpse of their creative work and personal life. Thus a personal memorandum or letter found in an attic, inserted in a book, or attached to a herbarium sheet, contributes a small facet to the personality and to the trend of thought during the lifetime of its author. True, fifty years is not a very long time, but precious facts should be saved from oblivion whenever they are found, just as we do not hesitate to perpetuate an unknown species with a new name, be it of Devonian or Recent age.

The first letter eloquently permits a glimpse into Cockerell's life, illuminating the friendly strife (and sometimes not so friendly) that flourishes among scientists, and without which science could not grow.

Boulder, Col.
Aug. 20, 1910.

My dear Dr. Rydberg.

I found your very interesting letter yesterday, on returning from a trip in the Mts. That prickly fruited rose is surely distinct from *pratincola*—but as to *Macdougallii* and *Underwoodii* I leave you to decide as I have never seen either. (My observation leads me to think that the importance of the infrastipular spines has been exaggerated, however). I found only one plant, which I have moved to my garden. It may have been (the seed) washed down the cañon from miles away, or carried by a bird from a still more distant spot. I will however try to find others. The old canes have slender straight prickles — I enclose a small piece. If we do not find another plant, I think the thing should have some place in your work, either temporarily as a variety(?) — or by mention without names. In my own practice (in zoology especially) I have often introduced a form as a variety, fully expecting that it would later prove a new species. (Rather the reverse is the custom in botany!). I have this year been planting all sorts of wild roses in my garden. I hope in the course of time to have some good observation. Our cinnamomeae of this region doubtless afford a series of forms like the canina of Europe, which it will take a number of years to fully elucidate.

Now about the fossils: since you say that you do not know anything about them, do not think me impudent if I proceed to lay down the law! In the first place it is *not a matter of geology at all, but* of botany. You need geology only as you need geography in the study of recent plants. In the second place, in relation to your Flora, you practically need only to consider the Tertiary plants. The Mesozoic are too doubtful as to genera, and the Palaeozoic hardly different, and all these are too remote to have any immediate bearing on the living floras. Now for a *good* account of the Tertiary strata of North America, which you can easily master, (excluding the details), get Osborn's recent bulletin on Tertiary Mammal Horizons, published by the U.S. Geological Survey. They will send it gratis, this paper is most interesting and significant in relation to living flora.

Now further, so far as the Rocky Mts. (are concerned), the Pliocene is a blank (as to plants) and the nearest thing to the modern flora (perhaps a million years old), of any consequence is the Florissant flora. This is, I would say, very much more important for you than any other—more important than all others combined, as it is relatively complete (with many herbaceous plants) and the plants are very well preserved. Now again, in the studies of the Florissant flora I have practically had to go it alone. The professional palaeobotanists know next to nothing about it, and give practically no help. The recent botanists won't attend to the matter, being busy with their own affairs. There is a comparable fossil flora in Europe, which was described by Heer. Last year I went to Zürich and saw Heer's types, and also went and corrected at Oeningen (Baden) the "European Florissant." Here then is the situation. We have at Florissant a splendid fossil flora, containing all sorts of things which bear on the present flora of the U.S., and I assure you, that if you will once take the trouble to look over even the literature of this subject you will find that you have quite a new idea of the meaning and history of the plant groups familiar to you today. You will be like some sociologist who has discovered that there is such a thing as history.

I write with the greater zeal, from the fact that I have dozens of things, well preserved, many of them that I cannot make out, and if some really competent recent botanist like yourself would get interested, we should doubtless get some very important light. Also, I daresay I have made some errors, which could be corrected. I cannot get anything useful out of Hollick and Knowlton,* nor could I from the European palaebotanists. Hollick described a couple of "new genera" from Florissant, but they are meaningless, and *Fagopsis* is, I am sure, only *Fagus*. I know, of course, that neither you nor any of the other active "recent" botanists will under any circumstances go heavily into palaeobotany — but I do not see why you should not work on it in the same way as you work from time to time on plants from out of your regular range because of the light they throw on your own flora.

I am naturally very eager for the appearance of your new work. What did you decide about *Tradescantia occidentalis* vs. *universitatis*? I still call it *universitatis*, as I cannot see how you can apply Britton's name to a plant which does not live in the range originally assigned. (Goodding's plant is certainly not the same). If you still disagree with me, why not ask Dr. Britton him-

*Well, Knowlton, when he was here, did give me one good hint. But he is working exclusively on the older floras. Hollick's **"Tmesipteris"** from Florissant is all wrong, and nothing like **Tmesipteris** at all.

self to arbitrate? Also, there is certainly only one species here.

Some time ago, I went into the *Cnicus, Cardius, Cirsium* matter. I concluded that *Cirsium* was valid for our species here and transferred the local species in ms — but nothing has been published. I rather hope that you will reach the same result.

I have also been at *Cornus*, and make our local species true *stolonifera*, your variety apparently not valid.

I hope you will stick to *Delphinium penardii*, not *penhardii* (of Nelson!). Penard (now of Geneva, a famous worker on Protozoa) is a good friend of mine, and I hate to see his name misused.

Castilleia haydenii, which Nelson credits (comb.) to Greene, was given by me in Bull. Torrey Bot. Club many years ago, in a paper on *Castilleia*.

Yours sincerely
Theo. D. A. Cockerell

Have you considered my *Mertensia secundorum?* It occurs here with *lanceolata*, and is I believe a dimorphic (Mendelian) form of it — but it will take breeding to prove it. The two are always readily distinguished.

Miss Pearl Turner yesterday showed me quantities of *Chrysanthemum leucanthemum*, gathered at the Bluebird mine, in the mts. of Boulder County.

Boulder, Colo.
June 26, 1912.

Dear Dr. Rydberg.

The *Rosa setulosa* matter becomes more complicated. I now find branches with strongly bristly fruit and fruit without bristles, all together! I enclose one herewith. What should be done in such a case?

I find here in Boulder 3 species of *Tragopogon* — two yellow — and one purple *(porrifolius)*. The two yellow ones are probably *dubius* and a variety of *pratensis*. Will let you know further when I have the thing worked out. My hybrid I reported in Daniels, Boulder Co. is *dubius* X *porrifolius*, not *pratensis*.

Yours sincerely,
Theo. D. A. Cockerell

The common *Arnica* here at Boulder, reported so far as *pedunculata*, has not linear leaves. It should rather be *monocephala*. Nelson makes both synonyms of *fulgens*. I think it should be —

(1) *fulgens* Pursh.
(2) *pedunculata* Rydb.
(2a) *pedunculata monocephala* (Rydb.)

T.D.A.C.

Theodore Dru Alison Cockerell, among palaeobotanists affectionately known as T.D.A., was born in 1866 in Surrey, England, and lived to the ripe old age of eighty-two. His interest in entomology and palaeobotany reveals a pioneering spirit, although he was not as prolific as some of his predecessors or contemporaries. Through his association with the University of Colorado in Boulder, Colorado, he had an enviable access to the living flora of the Rocky Mountains, to its fossils, and especially to the Tertiary flora and entomological fauna of the now classical Florissant beds.

In this respect, previous haphazard work on fossils of this area, and an apparent lack of interest and cooperation on the part of his peers, made progress slower than desired. It was not until Ralph W. Chaney's school of the University of California became actively engaged in western palaeobotany that the Florissant was given due attention and its flora thoroughly revised and compiled in Harry D. MacGinitie's outstanding work, *The Flora of the Florissant Beds in Colorado* (Carnegie Inst. Wash. Pub., 599, 1953). By 1890, Samuel H. Scudder had assembled and published a gigantic volume of *The Tertiary Insects of North America* with special reference to the Tertiary lake beds of Florissant, Colorado (U.S. Geological Survey, Territories, vol. 13, 1890).

This work, then, had been available to Cockerell for his various papers on fossil insects and plants, one of which is entitled "Florissant, a Miocene Pompeii." [The Florissant beds are now considered to be of Lower Oligocene age (Chaney and Axelrod, 1959)]. Cockerell's interest in fossils appears to have begun in 1906, resulting in about forty contributions in the thirty years following. Prior to 1906, from 1887 on, about forty botanical papers emanated from his diligent pen. It was his interest in the Rocky Mountain flora which inevitably resulted in professional exchanges with the botanist Per Axel Rydberg.

Rydberg, born in Odh, Westgoetland, Sweden, was associated with The New York Botanical Garden from 1899 and became curator in 1907, a post which he held until his death in 1931. He is known to botany as an outstanding taxonomist and phytographer of the Rocky Mountains and the Great Plains. Two of his favorite families were the *Rosaceae* and the *Compositae* as the references in Cockerell's letters indicate.

The rose specimens referred to and submitted by Cockerell are now placed under *Rosa arkansana* Porter. *Mertensia secundorum* Cockerell is now assigned to *M. lateriflora* Greene, but *Tradescantia universitatis* Cockerell, *Castilleia (Castilleja) haydenii* (A. Gray) Cockerell, as well as *Delphinium penardii* Huth, remain valid. The fossil *Fagopsis*, of which Cockerell is "sure" that it is "only *Fagus,*" has stood the test of time and palaeobotanists and is still known as *Fagopsis longifolia* (Lesquereux) Hollick of the *Fagaceae*. Pollen studies, however, seem to cast doubt on the validity of its family status, and only future research will determine whether it belongs to the *Fagaceae* or the *Betulaceae*.

Thus, after fifty years, some of the old questions are resolved, and new ones are posed to the burden of the coming generation.

HORTICULTURAL EDUCATION (from page 51)

a similar level in the United States. The University of Nottingham, in England, locates its horticultural students at Sutton Bonington, some distance from the main part of the university; it offers a completely scientific training for undergraduate and graduate student and at the same time provides orchard, vegetable garden, ornamental garden, and greenhouse facilities for research. Although their facilities are not located separately, the University of Bristol and Reading University operate in a similar pattern.

Possibly the most concrete way to emphasize the value that is placed on practical experience is to cite an example of a skilled plantsman and craftsman who worked in the botanical garden at Cambridge University. After four years of satisfactory demonstration of his ability, Cambridge University provided him with an opportunity to obtain a Master's Degree. This horticulturist

had not had undergraduate training; but after he had taken courses in plant physiology, taxonomy, and experimental techniques, and published some research, a Master's Degree in Botany was conferred upon him, and he was given faculty status by the university.

Position of U.S. Education

Horticulturists in the United States would be shocked if they realized how few people know what horticulture is. We, as a group, take horticulture for granted. We know what it is, we like it, we like one another—but we tend to spend too much time communicating with one another and not enough time communicating with those who ought to be made aware of horticulture.

Out of twenty thousand students at Michigan State University, there are approximately two hundred students of horticulture. This number is small perhaps because so few know what horticulture is. Young people grow up in a school system which does not expose them to horticulture as a profession.

I am not advocating greatly increased numbers of students of horticulture, but that everyone be exposed to the opportunity to learn what horticulture is. When I was talking recently with a salesman, a young man twenty years old, at a local nursery and garden store, he asked, "Is there any future for a person in this kind of work? You know I had intended to be a beauty operator, until I started to work here. Now I have decided that I would rather work to make the 'outside' more beautiful than to make people more beautiful. I never knew that this kind of work existed." Yes, there are relatively few people who know what horticulture is.

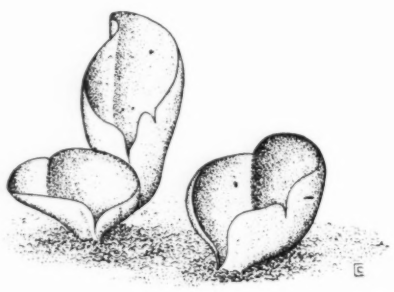
There is a tremendous opportunity for the use of horticulture in helping delinquent children, suburban home owners, and retired men and women....

American universities in recent years may have underestimated the importance of practical experience. Agricultural scientists have worked at being more scientific. The emphasis on science has tended to get out of proportion to the emphasis on practical procedures. Let us not discount the importance of science. There should be better science and more of it, but it cannot become much better unless it is offered to students who have had a practical foundation. Certainly in the minds of educators in foreign countries, horticultural educators in the United States do not command the respect that they deserve. Internationally, our position in horticultural education is both strong and weak. Our strength is exhibited by our emphasis on all the sciences, and by our imagination and ability to seize opportunities for research and to produce results often on the basis of trial and error. Our weakness, however, is in the lack of appreciation for horticulture on the part of the general public and our failure to insist on practical experience as an important requirement of horticultural education.

How to Fill This Void

To improve the appreciation of horticulture on the part of the general public is a slow process, but we must endorse, sponsor, and help to develop vocational outlets for children, adults, and especially teachers. We must increase such programs as the one in operation for children at the Royal Botanic Gardens in Hamilton, Ontario, and the one that is operated by the Department of Education in Cleveland, Ohio. Work will have to be done with colleges to get professional teachers to recognize the importance of horticultural courses of the type that is offered at Farmingdale, Long Island, and at other technical schools, chiefly in New York and California. Courses and lectures for adults similar to those at the Brooklyn Botanic Garden, The New York Botanical Garden, Longwood Gardens, and Morton Arboretum must be endorsed and encouraged.

We must also work toward the acceptance of practical experience as a requirement by universities. Some have it and some enforce it, but it should be a much more thoroughly supervised type of internship, similar to that which is in effect for doctors, dentists, and lawyers. Certainly universities cannot be expected to furnish the opportunities to get practical experience, but universities can serve as the control and not award degrees to students unless the students have been exposed to practical experience. Such a system would improve the professional status of horticulture internationally. A university must be prepared to accept criticism, if it does not make sure that its graduates know the skills required of a good fruit grower, vegetable grower, nurseryman, florist, and specialist in affiliated fields of endeavor. It is the responsibility of our system of education to produce, as well as scientists, young people who will be an asset to the horticultural industry, who will produce and market products to more discriminating consumers and who, at the same time, will contribute cultural values to our way of life.



WHERE THE AIS CAME FROM

The Nineteenth Region of the American Iris Society and The New York Botanical Garden have invited the members of the American Iris Society to a convention in New York City in May 1961, commemorating the founding of the Society at the Garden on January 29, 1920, at a meeting arranged by Dr. H. A. Gleason, then Curator of The New York Botanical Garden, Dr. John C. Wister, and the late Frank Presbrey of Montclair, New Jersey. We believe our readers will be interested in Mrs. E. McGarvey's comments on Dr. Wister's talk at the 1959 convention of the American Iris Society in Oklahoma City. These comments have been excerpted from her article in the August 1959 Newsletter of the Empire State Iris Society.

In John Wister's speech he told from his own recollections "how the Society came into being. We all know where we are today, something about where we are going, but few here know where we came from."

I had read some of the history of AIS, and I also remember a man named Wister, who lived in our neighborhood when I was a youngster. He had a lovely garden and devoted most of his time to flowers and their culture.

I thought this a most desirable occupation for a man, and now I know how abundant has been his reward. I often wondered why he carried a briefcase and was so often seen going in haste to the commuters' station as many

The first trial garden of the American Iris Society was located at The New York Botanical Garden. Picture taken in 1924.

businessmen did. One day I was told by a former schoolmate of his that, "John Wister labors as long on his plants, and interests related to them, as I do on my medical practice."

Delayed in Europe, while waiting to be sent home after World War I, he (John Wister) decided to "look in on" some of the flower growers over there, "to see what they were doing." At the time, he was greatly interested in peonies, irises, lilacs, as well as other garden flowers.

He found good hybrids that were unnamed and unclaimed by their originators, and unknown irises tagged and sold by familiar names. Plants grown from random seeds were being sold by names belonging to other plants, to which they bore some resemblance.

It seemed to Dr. Wister that the iris world was falling into chaos and something had to be done about it. He had the wisdom to see that unless restraints and orderly methods were adopted, by those who were interested in promoting the iris as a cultured plant, it would become increasingly difficult to establish the identity of most iris clones.

Only the initiated could understand the real nature of the problems that beset the iris growers. John Wister was one of these who could.

Iris culture was expanding to create and meet new market demands. This was a most desirable goal, but the methods were destroying the very markets that growers were anxious to build. It was reported that in one large shipment of irises received in this country from Europe, not a single iris was correctly labeled.

While still in Europe, John Wister went to the Royal Horticultural Society seeking direction for the work he planned to do. There he met men who were working on the identification of the species and discovered that they, too, were eager to have improved methods of registration.

He made himself familiar with the work of Sir Michael Foster, the British scientist who laid the foundation for the development of our modern irises. On his return to the United States, he went to see Dr. H. A. Gleason. He made known to Dr. Gleason his plan to organize an iris society that would serve the purpose of giving iris growers and distributors the help and direction so important to the development of this flower.

Dr. Gleason not only approved, he gave Wister the names of men whose background work would qualify any one of them as appropriate choice for president of the society. John Wister found that one after the other, each of these men had some logical reason for not accepting the presidency, yet each of them wanted to hold office when the organization was formed.

William A. Patterson would be glad to be vice-president; R. L. Sturtevant to be secretary; Fran H. Priestly to be treasurer. On reporting to Dr. Gleason that although his chief mission had not been accomplished, he did have excellent volunteers for the other top offices, Dr. Wister then suggested that Gleason himself might have to take on the responsibility. "No," said Dr. Gleason, "I can't do that because I am most anxious to serve on the board of directors, so, John, the job is up to you."

The organization work went on from there. The first Bulletin, published in June 1920, listed four hundred and twenty charter members.

As Dr. Wister spoke to the group gathered for the convention, he spoke to only a segment of the total membership. Yet in numbers we were twice the size of the original membership listed in that first Bulletin. He expressed his personal hopes for future accomplishments. "I would like to see irises in more gardens throughout the land." To hybridizers he suggested that more work be done on the median and dwarf varieties, "since they can be used to good advantage in all garden plans." Fragrance, he feels, has been too often lost in hybrids. As an essential part of their program, he urged breeders to work "toward restoring fragrance."

. . . . Many of us gained a better understanding of the importance of the work of the AIS to the maintenance of orderly progressive improvement in the development, the registration, and distribution of the irises of today. Dr. Wister said, "It is in great contrast to the muddle, in the iris world, of the early twenties."

His last remark brings to light a rare human trait: the ability to be gracious to others for the support of an idea, that it was to their own great advantage to support. Perhaps this trait of graciousness in a totally delightful person is one of the fundamental reasons why John Wister's notion that we should have an iris society became a reality.

It is of interest to know who responded to the invitation extended by Dr. L. N. Britton, then Director of The New York Botanical Garden, to attend the meeting on January 29, 1920: B. Y. Morrison, then of the United States Department of Agriculture, now of Pass Christian, Mississippi; Bertram Farr, America's first notable iris hybridizer; T. A. Havemeyer, then president of the Horticultural Society of New York; Robert Sturtevant of iris fame; Prof. A. P. Saunders; Mrs. Ethel Anson Peckham, Honorary Curator of the iris and narcissus collections at The New York Botani-

cal Garden; Mrs. Frances Cleveland of Eatontown, Mrs. E. P. McKinney of Madison, and Mrs. Charles H. Stout of Short Hills, New Jersey; Mrs. Louise B. Wilder; Lee Bonnewitz; James Boyd, then president of the Pennsylvania Horticultural Society.

Among those interested in the American Iris Society from its very early days, and famous still in the iris world, are Paul Cook, Robert Schreiner, David Hall. The New York Botanical Garden and the Nineteenth Region extend a special invitation to them and others familiar with iris history to attend the convention in May 1961 at the birthplace of the Society. The keynote of this meeting will be the founding of the Society and its accomplishments in the intervening forty-one years.

A Country Housewife's Garden

By Gertrude B. Foster

Mrs. Foster is Editor of
THE HERB GROWER MAGAZINE

ONE OF THE privileges of country living is planning a day's activities according to the weather. An automatic washer and dryer have freed me from worrying about sunshine on wash days, but I am quite happy to go along with the weather in doing other things. In the spring, especially, there are days which suddenly produce sunshine and warmth that bid me to walk in the garden or down to the open meadow. Such blessed intervals, in March, between scudding clouds and sudden snowstorms, may be just a matter of hours. Fortunately I am free to improve those shining hours.

My husband is a great student of weather. He rises early, studies the sky, then checks his weather instruments. For two hours before my breakfast time he receives and transmits reports of weather conditions all over New England over short-wave radio. As secretary of the New England Weather Net, a group of amateur radio operators and weather observers from Maine to Brooklyn, New York, he keeps records of temperature, barometer, wind direction, and cloud cover, three hundred and sixty-five days a year. More than sixty other early risers, who are also "Hams," bestir themselves to get on the air by 5:30 a.m. every day to make up the coverage of the New England Weather Net. This is a service they perform, without any hope of gain, for the information of travelers, farmers, or anyone else who cares to listen to short wave at 3900 Kc. W.B.Z.'s official weatherman, Don Kent, now uses the New England Weather Net reports to augment his own forecasts on TV and radio from Boston each morning.

While Phil has a second cup of coffee with me after the Net, we discuss the doings of the day as dictated by the weather. A warm rain may remind us to pull back the glass on the pithouse to let the rain wash the bay, *Laurus nobilis*. In the coldest weather the sun-heated, deep coldframe needs no watering as long as the sash remains closed. About the time of the spring equinox, we usually get a southwesterly storm (the kind that 'brings the nester') to mark the difference between winter and spring. Such days are called "bad" weather by commercial radio weathermen. To us, they are most welcome. As the natives say, it takes a good rain to settle the mud—especially true in the days of dirt roads. The spring rains are helpful to our long gravel and dirt drive also.

A warm rain in April may be a pleasure to work in—when it falls as fine mist rather than pelting down. Seedlings of hardy annuals, ambrosia, sweet wormwood, or annual woodruff, which have been started indoors, can be set out in the garden on a day when clouds hang low full of the promise of showers. Without sun to wilt the tender young plants, the work of pricking them out is made much easier, and little watering is necessary.

French tarragon and its near relative, *Artemisia schmidtiana nana*, the lovely 'Silver Mound', must be divided as soon as the ground is thawed. Lift the old plants from the earth and gently pull the roots apart. Each section, with a few new sprouts, will make a fine young plant the first year. After the third year, like chrysanthemums to which they are kin, they tend to die out in the middle if not separated. Such pleasant tasks, undertaken during the few hours between showers, are a foretaste of garden work that must wait until May in our climate. There must be fresh winds and plenty of sunshine to dry out the ground enough to have it ready for digging and seed sowing.

I am a miser about signs of spring—I am not eager to hasten it. I want to savor every sun-warmed day and greet each returning bird species. Two weeks ago a pair of bluebirds followed Phil and me on a noon-time walk around the fence line. They flew from post to post. Every once in a while the male took wing to warble a song which seemed to express the joy in our hearts at the matching blue of his wings and back to that of the sky.

One evening there was great excitement on a trip to carry the garbage to the compost pit in the old barn foundation. It started with the sharp buzz of a woodcock's call from the edge of the woods. When I went past the compost pit and down towards the river, I heard the curious "peent," so like an electric buzzer, sounding from different points in the pasture; sometimes ahead of me, sometimes behind me. It took me a while to realize that this was but the curtain call for a drama of feathered love.

It was migration time for the woodcocks. During the day, they kept to the shelter of the low, brushy woods. At dusk they moved down to the meadows where grubs and worms were available to their long beaks when poked in the wet ground. Soon one male took time from feeding to execute a mating ritual, which consisted of a flight straight upwards with a fluttering cry or series of notes. I could make out the hurtling form circling on high at terrific speed, as he was silhouetted against the brightness of the western horizon, where the sun had lately set. As quickly as he went up, he returned to earth.

It was eerie to hear the birds around me on the ground, without being able to see them in the waning light. They had waited until it was dusk enough to make any stump or tuft of grass seem alive before making their appearance in the pasture.

After waiting patiently, until my neck was stiff, for one of the birds to

come near me, I turned towards the house. Suddenly a woodcock dropped silently down in the grass not twenty feet from where I stood. I could feel the electricity of his wings but heard no sound. I could make out the long beak, slightly curved, and the small body on short, teetering legs. While I waited, frozen in my tracks, another dim form floated down and landed behind the big elm tree at the corner of the house. I could feel the birds' consciousness of each other and their wary caution that precluded any buzzing or twittering in my presence. Finally, just before I exhausted my balance, a third woodcock winged into sight to drop down and make a triangle. When I could hold the pose no longer, they rose straight up and angled away, taking great care to keep below the shadow of the hill in the background, so that I felt rather than saw them go.

When I witness such a thrilling performance, I am thankful that the size of our place does not permit our clearing all the tangles of bushes and weeds which make a home for wild life, however contrary this may be to landscape design. A cardinal hopping down from a thicket of forsythia to perform a mating dance, with outspread wings, upon one of the rocks in the rock garden is compensation for not being able to trim all the tangled growth. In May the race between the weeds and the garden plants begins in earnest, so moments for strolling about and observing signs of spring in March and April are sweetly taken.

TALL PLANTS (from page 58)

plum, and dusty pink; bonesets in white and pale plum; purple Joe-Pye-weed; goldenrods and asters in every shade of lavender and white.

In other meadows, generally by themselves, are large drifts of pale lavender beebalms and, where there is shade, the scarlet ones. When these native plants are brought into the garden, they soon form huge clumps likely to crowd out more fragile exotics. So here, even more actively than in most gardening, it is essential to thin the plantings. Gardening always seems to me to be an unending sequence of feeding and encouraging plants and then, when they respond to one's care, of digging out the superfluous or cutting back the ones that have increased too much in girth.

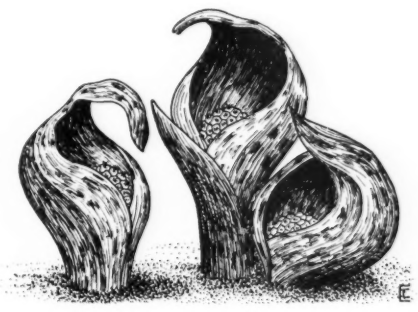
Among the late summer-blooming wildlings, *Asclepias incarnata*, with flowers the color of ashes of roses on stems four feet high, is the best for the border. *A. tuberosa* has popular names indicative of its uses, such as pleurisy-root and wind-root, and of its looks, such as swallow-wort root; it is also known as butterfly-weed, because the butterflies flutter around its umbels of brilliant orange flowers.

One eupatorium I have had for years, because it came intertwined in a shrub from my earlier garden, is *E. perfoliatum*; this is popularly called boneset, sweating plant, and Indian sage. It has cream-white or slightly greyish flowers growing in close heads on stems five feet high.

The violet-colored beebalm is *Monarda fistulosa.* The monarda which most frequently has red flowers, though the flowers come in many other colors, is *M. didyma.* It is popularly known as oswego tea, wild bergamot, and fragrant balm. Botanical differences are slight between the two; in *M. didyma* the bracts beneath the flowers are tinted red, and the leaves sometimes have red veins. There is a bit of lemon with the scent of mint. The red is absent from the bracts and leaves of *M. fistulosa.* Both monardas grow two to three feet high.

Monarda didyma and a third *Asclepias,* namely *punctata*, yield thymol which is antiseptic. Creek Indians made fusions of various monardas with certain of the willows (the particular ones not designated) to give as a drink and bath to patients suffering from dropsy. They also used the fusions as cathartics and for colds.

These are only a few of the many tall plants with herbal virtues, with which to enhance the more naturalistic plantings of herbs in the gardens of today.



BOOK REVIEWS

THE GUIDE TO GARDEN FLOWERS. Norman Taylor. 315 pages, illustrated by Eduardo Salgado, indexed. Houghton Mifflin Company, Boston, Massachusetts. 1958. $4.95.

As a book written mainly for identification of garden flowers, this joint effort of Mr. Taylor and Mr. Salgado is a welcome contribution.

The arrangement of plants results from following the double-branching key with which one starts on the trail of the plant to be identified. The key is very simple, sometimes following the familiar pattern—sometimes quite unique—but essentially easy to follow. One eventually should have his plant in its proper family—and additional leads help him to arrive at the correct species. Just the breakdown of flowers into color groups which the book offers may lead the reader to his objective.

The inclusion of thirty-six plates, which illustrate 324 kinds of flowers, accurately and in very acceptable color, makes the book particularly valuable. The scale used to fit a number of flowers on each plate cannot be proportional, but this detail interferes little with usefulness. The eighty-eight plants represented in line illustrations are also good additions.

Once the identity of a plant has been gained, Mr. Taylor gives brief cultural directions which are adequate and reliable. Native habitat, color, general height and varieties (with which species are tumbled) are also provided.

It is regrettable that the author so often warns his readers about confusion in varieties offered by seedsmen. This would seem to build up a distrust of seedsmen which, in my experience, is undeserved.

One lays aside the book, wishing that more guidance concerning the best varieties could have been included—that more caution against use of plants which often become undesirable in a garden could have been noted. More emphasis on flowering periods would also have been a grateful addition. Perhaps some of the numerous plants which one has little chance of ever seeing could have been eliminated to give space to these important matters.

The main purpose of the book is identification, and for this, it is sure to be a very helpful aid—its fine pictures worth enjoying over and over.

HOWARD W. SWIFT

DESIGNS FOR OUTDOOR LIVING, John Burton Brimer. 420 pages, illustrated, indexed. Doubleday & Company, New York. 1959. $3.95.

With the emphasis of modern outdoor living centering around the terrace, John Brimer's book on woodworking and masonry in relation to the terrace is especially timely.

The most clumsy thumbsmasher takes courage and unconsciously develops an enthusiasm to begin a project because of the simple way the author acquaints the reader with the necessary "know-how" to accomplish his work.

By clean-cut illustrations, the various tools and their uses are presented. This is followed with sizes, kinds and grades of wood materials with descriptions on where best to use each one.

With this start you are soon off the ground — with birds houses, not just any bird houses but specific ones for many kinds of birds. Plant containers, wind shields,

coldframes, trellises and fences appear with numerous illustrations until you suddenly realize you are looking at tool houses—what next, houses? Yes, garden houses and shelters with tables, benches, service carts and potting tables.

But here you are in for a fall. Your attention is suddenly brought back to earth with a display of more tools—this time for masonry uses. Illustrations of steps, ramps, walls, walks and finally the terrace itself in various shapes and surfaces with pools and planters bring this book to a very competent conclusion.

ARTHUR MURPHY
Landscape Architect
Dept. of Parks, City of New York

A NATURAL HISTORY OF NEW YORK CITY. John Kieran. Illustrated by Henry Bugbee Kane. 428 pages, indexed. Houghton Mifflin Co., Boston. 1959. $5.75.

John Kieran has been creeping up on this book for fifty years, actually writing it over the past five years, and with the same unhurried pace he leads us along the waterways and through the fields and backyards and parks of the great city. It will not be a surprise to friends of The New York Botanical Garden that he devotes more than a fourth of the book to the lowly forms of plant life, the flowers and the trees and shrubs of the area, for the Garden has been one of his happiest hunting grounds for many years.

If anything walks, swims, flies, or grows within the city limits or even the nearby parts of Westchester, Long Island, and New Jersey, John Kieran is pretty sure to know about it—probably to have seen it first. He is not reluctant to tell where he found it ("If you walk over the eastern edge of the Van Cortlandt Parade Ground and dip down to what was once the right of way of the Getty Square branch of the Putnam Division Railroad you will be—in the flowering season—up to your ankles in Blue Curls") and, except that it is a thick and therefore heavy book, the Kieran Natural History could almost be used as a field guide. Not that it is technical; it is a "reading book," and there is much pleasure and information for any naturalist—be his interests geology, geography, climate, aquatic creatures, insects, flowers, trees, reptiles, mammals, or birds.

WILLIAM BRIDGES
Curator of Publications
New York Zoological Society

HOW TO PLAN MODERN HOME GROUNDS. Henry B. Aul. 312 pages, illustrated, indexed. Sheridan House, Inc., New York. 1959. $5.00.

Among the planners of home grounds, Henry B. Aul has always had a special place, namely, that of showing by illustration how to actually build garden structures, walks, steps, walls, pools.

In this book he again shows how to meet the problems of the home grounds such as parking, driveway and walk combinations, terraces and planting details with excellent illustrations.

In his enthusiasm for these necessary details, the design or layout for the property has a tendency to be broken up into small sections. This is partly caused by Mr. Aul's leaning toward vegetable and fruit areas. In many cases more emphasis is placed on recreation, games and play areas for children by other designers in the landscape field or in larger grass areas to give a feeling of space on small properties.

(Continued on page 76)

BACK ISSUES AND REPRINTS

All back issues and reprints of back issues of *Addisonia*, *Brittonia*, *Economic Botany*, *Memoirs* of *The New York Botanical Garden*, *Mycologia*, and *North American Flora* are handled exclusively by Stechert-Hafner, 31 East 10th St., New York 3, N. Y. All inquiries should be addressed to that company.

BOOKS

Stechert-Hafner also sells the following books published for The New York Botanical Garden at these list prices:

Britton: *Flora of Bermuda*		$10.00
Britton and Millspaugh: *The Bahama Flora*		9.50
Gleason: *Plants of the Vicinity of New York*		3.00
Gleason and Collaborators: *The New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada**	3 vols.	35.00
*Family Keys from New Britton and Brown Flora**		1.00
Hagelstein: *The Mycetozoa*		7.50
Mackenzie: *North American Cariceae*	2 vols.	20.00
Keys to the North American Species of Carex		Price on request
Rydberg: *Flora of the Prairies and Plains of Central North America*		8.50
Van Melle: *Review of Juniperus Chinensis et al*		1.50

*This work may also be purchased from The New York Botanical Garden. There is a handling charge of $1.00 on The New Britton and Brown Flora.

SERIALS

Addisonia, colored plates of flowering plants accompanied by non-technical descriptions; 8 plates to a part, 4 parts to a volume. Published one part annually. Free to members of the Garden; $10.00 per volume to others.

Brittonia, published quarterly for the American Society of Plant Taxonomists. Subscription included in the Society's dues $6.50 a year. $7.50 per volume to others.

Economic Botany, official organ of the Society of Economic Botany, published quarterly. Members' subscription included in Society's dues $7.50 a year. Subscription to non-members $8.00 a year.

Memoirs of The New York Botanical Garden, scientific papers by members of the staff and collaborators; issued irregularly. Vol. 10, $10.00. Prices of earlier volumes on request.

Mycologia, official organ of the Mycological Society of America, published bi-monthly. Members' subscription included in Society's dues $8.00 a year. Subscription to non-members $8.50 a year.

North American Flora, descriptions of the wild plants of North America, including Greenland, the West Indies, and Central America. 100 parts issued; now in 2nd series. Prices of parts on request.

The Garden Journal, non-technical articles on botanical, horticultural, and kindred subjects, published bi-monthly. Free to members of the Garden. Subscription $3.00 a year (foreign $3.50) to others.

Subscriptions to the above periodicals should be sent to The New York Botanical Garden. Back issues of The Garden Journal, 75c each, and of The Journal of The New York Botanical Garden, 50c each, are available from The Garden.

BOOKLETS

Catalog of Hardy Trees and Shrubs, a list of the woody plants grown outdoors at the Garden in 1942. Illus. Price 75¢ per copy.

Hardy Ferns and Their Culture. Illus. Price 25¢ per copy.

Flora of the Unicorn Tapestries. Illus. Price 25¢ per copy.

Food and Drug Plants of the North American Indians. Price 25¢ per copy.

Montgomery Conifer Collection, non-technical descriptions of conifers with information on history, habitat, and usage. Illus. Price 50¢ per copy.

Plants of the Holy Scriptures. Price 25¢ per copy.

Succulent Plants of New and Old World Deserts. Illus. Price 50¢ per copy.

Vegetables and Fruits for the Home Garden. Price 25¢ per copy.

The above booklets are obtainable from The New York Botanical Garden.

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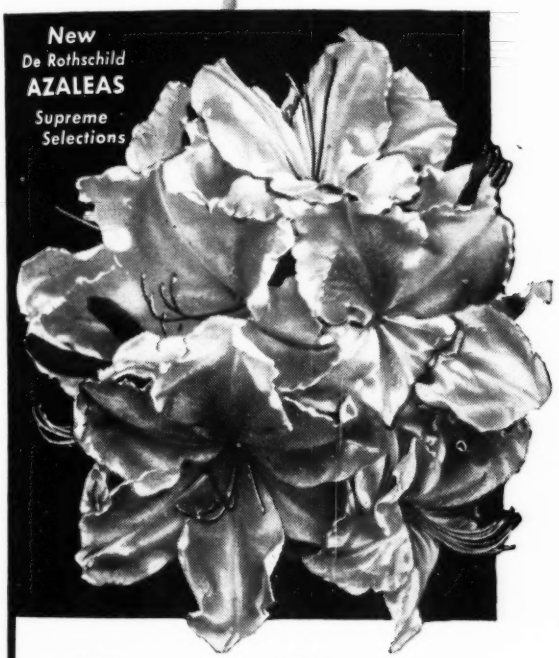

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New ABELIOPHYLLUM, *Distichum,* called white forsythia, is a most beautiful conversation plant. Palest pink when buds open, this 3½ foot, sun-worshiping shrub soon turns into the most welcome snow-white Spring flower-drift you've ever seen.

New VIBURNUM, *Pink Beauty* is a pink Tomentosum that surpasses all other shrubs for delicate and bountiful beauty. Flowers open white and gradually turn to clear, sunset pink. Amazingly, it prefers only the simplest of care.

New MALUS *Red Jade.* A two-season beauty that originated in New York's famous Brooklyn Botanic Gardens. In Spring, this softly weeping tree is a flower-fall of white; in Autumn, the fruit ripens to striking scarlet, a marvelous display.

New ROBINIA, *Friesia* makes a bright three-season showing as patio or lawn tree. Spring brings pale yellow leaf buds that open to rich gold plumes, slowly turning copper as Fall approaches. Thorns gleam red; the shoots, orange—unforgettable color fantasy.

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New DICENTRA, *Bountiful* is a non-stop bloomer. From bud-break in Spring through mid-summer, it produces masses of fuchsia-red flowers that are almost double the size of the common Plumy Bleeding Heart. Early Fall to frost, blossoms again cover its handsome dark green foliage.

New GENTIANA, *Makinoi,* makes a lovely spot of color in late Summer and early Fall gardens. A deep Gentian-blue, celebrated in song and story, new Oriental-import *Makinoi* grows about 12 inches tall and has been proven exceptionally hardy by Wayside testing.

HOSTA, *Thomas Hogg.* An unusually handsome border plant. Large, glossy leaves of richest green are dramatically edged in silver. In early Fall, its lovely lavender flowers are a charming accent.

New PHLOX, Symons-Jeune Hybrids, created in England, bring to your Phlox collection extreme hardiness, exquisite clarity and variety of color plus extraordinary abundance of blooms shading from white to brilliant orange-scarlet and deep salmon-pink.

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New SEDUM, *Indian Chief* provides a gorgeous spot of color in your Fall border. All during the Spring and Summer it offers an oasis of cool, gray-green foliage; then in cooler weather, it tops itself with red-copper blooms that would be stunning against a background of Wayside Chrysanthemums.

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Wayside Gardens

The chapter on the swimming pool on the small property shows a modern approach to the small property problems. The question arises as to whether the elimination of the vegetable and flower area or at least substituting a flower border along the property line would give a feeling of more space.

A natural woodland scene shown on page 242 again demonstrates Mr. Aul's versatility in illustration and composition. Here there is a desire however to move the bench shelter and fireplace farther to the east side of the property in order to obtain an uninterrupted distant view that this particular lot affords.

These points do not outweigh the wealth of information that is so clearly presented. The plan on page 265 is a particularly satisfying example of Mr. Aul's design approach to the small property. It is a place you would like to visit.

ARTHUR MURPHY
Landscape Architect
Dept. of Parks, City of New York

JAPANESE GARDENS FOR TODAY. David H. Engel. 270 pages, indexed, illustrations in black and white, and color. Charles E. Tuttle Company, Rutland, Vermont. 1959. $15.00.

Although I am no expert on Japanese gardens, my love for them was deep-rooted in my childhood days, and I have missed them during the forty years of my life in the West. Now that a great interest in things Japanese has developed in America, I look forward to an increase of Japanese influence in gardens as has appeared in architecture.

I know of no other book which could better further such a development than *Japanese Gardens for Today*. In its first section, "The Theory: Why and What," there is a thorough and clear description of the characteristics and the philosophy which are inherent in Japanese gardens.

The second section on "The Practice: How?" is replete with information as to the techniques of designing and construction with details as to plantings and accessories. With such information one could construct an authentic garden of Japan or could draw from it many ideas which could be combined with gardens here.

The book is beautifully illustrated with photographs from almost all the well-known gardens in Japan, as well as from many beautiful private gardens which are not open to the public. I highly recommend this book.

MITSU (MRS. YONEO) ARAI
Greenwich, Connecticut

THE ART OF THE JAPANESE GARDEN. Tatsuo Ishimoto. 128 pages, illustrated. Crown Publishers, New York. 1958. $2.95.

Mr. Ishimoto's book is attractively illustrated (168 photographs) and concisely written, with the thought throughout for the adaptation of the Japanese garden to American conditions. Accompanying many of the photographs are garden plans with arrows showing the location from which the photographs were taken. This aids the reader in visualizing the layout.

Small gardens (17 x 20 feet or less) are mentioned and illustrated. These should be of interest to city dwellers. In Japan, in family-style private gardens "the gardenmaker today works with a relatively free hand." Over the centuries, he "has learned to achieve his natural effects with few and simple materials, to suggest, to hint, to edit and to eliminate."

The table of contents is interesting; each chapter heading is descriptive and informative. For example, "What makes a Japanese garden?"; "Japanese ideas are changing"; "The entry garden welcomes the guest"; "This is a bamboo garden"; "A Japanese garden, Western style."

In the brief summary, it is suggested that in building a Japanese-inspired garden in America, native trees and shrubs can be used that will give the traditional Japanese effect, yet perform well in our climate.

LOUIS BUHLE
Brooklyn Botanic Garden

FLOWER ARRANGING FOR FUN. Hazel Peckinpaugh Dunlop. 119 pages, illustrated. The Viking Press, New York. 1959. $4.95.

Mrs. Dunlop with her extensive experience in the floral arranger's art gives a comprehensive digest of the principles of design as a guide in creating original compositions, using many types of plant materials.

The seven chapters present practical information to assist the flower arranger, decorator, florist, and average homemaker in selecting materials (common or exotic), choosing interesting containers, and properly treating cut-plant materials to prolong their beauty and freshness. Illustrations in color and many in black and white, with one chapter demonstrating step-by-step procedures in placing the parts of the arrangement, and, finally, comments on rules, shows, and judging complete the contents of this informative book.

Predominantly, the compositions show the Japanese influence, which is pleasing in its naturalistic charm. The line-mass arrangements are a blend of the East and West concepts, and are interesting in form and pattern.

The quality and distinction of Mrs. Dunlop's choice of containers and plant materials are inspirational, and there is much useful information for the beginner as well as the experienced exhibitor. *Flower Arranging for Fun* would be a worthwhile addition to any arranger's bookshelf.

MRS. WILLIAM A. MCGREGOR
Bronxville, New York

THE ENCYCLOPEDIA OF ORGANIC GARDENING. J. I. Rodale and staff. 1145 pages, illustrated. Rodale Books, Inc., Emmaus, Pennsylvania. 1959. $7.00.

The authors in this well-printed "nontechnical" compilation observe the Bluegrass Line less consistently than the *Organic Gardening and Farming* line. While many writers are qualified authorities, some peculiar, horticulturally outgrown, and often conflicting opinions are perpetuated. Thus on American persimmon, there's a choice of "ripening from the middle of summer through December," or (by a landscape architect) "frost action is necessary to make it palatable." In two pages on the azalea, not one species or clone is named, but "it is an evergreen plant all year." Mendelism, crossing, and orchard pollination are clearly discussed at various lengths, but evidently the "mimosa" article's writer has unusually sensitive plants, for "to insure bloom, you will find that mimosas are like holly and many other trees — you will need two or more. Sometimes single ones bloom and sometimes they do not." (The plural ones, invariably?) Under "cacti," we learn that they won't stand frost, and: "How hybridizing is done. Onto the top of every plant another cactus is grafted. Vari-colored and unique flowers result from this procedure." Also, "Roughly speaking, we can divide the cacti world into three sections: cacti generally, orchid cacti, succulents."

This book needs smoother speaking and rougher editing.

J. C. MCDANIEL
University of Illinois
Urbana, Illinois

AN EASY GUIDE TO HOUSE PLANTS. Arno and Irene Nehrling. 100 pages, illustrated, indexed. Hearthside Press, New York. 1958. $2.95.

The book is a must for housewives who want to decorate with house plants and for those who have planters built into their new homes. The aim of the authors is to make indoor gardening as easy as possible, even for the beginner.

Decorations with plants in groups and in planters has been covered extensively, from the choosing of plants from the florist to the methods of putting them in the planter. Plants are listed, with illustrations and diagrams, according to exposure and water

(Continued on page 81)

Diseases and Pests of Ornamental Plants

by P. P. Pirone, B. O. Dodge, and H. W. Rickett

Third edition, 1960. 760 pages, 6x9, 221 illustrations, index.
To be published in March 1960

This complete, well-organized book has become a standard reference guide for both the professional and the serious amateur gardener. Comprehensive and authoritative, it covers the pests and diseases of nearly five hundred genera of ornamental plants (including lawn grasses) grown in the United States, and their control.

The new edition is 122 pages larger than the second edition, and has more illustrations.

Diseases and Pests of Ornamental Plants is an official publication of The New York Botanical Garden.

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NEWS, NOTES and COMMENTS

Redwoods Exhibit. As part of the Redwoods Exhibit at The New York Botanical Garden, a Tertiary fossil collection of the "dawn redwood," *Metasequoia occidentalis*, and plants associated with its age and habitat is displayed in the rotunda of the second floor of the Museum and Administration Building.

Discovery of the living dawn redwood, *Metasequoia glyptostroboides*, some fifteen years ago, caused as great a stir in palaeobotany as did the discovery of the first coelacanth, *Latimeria*, a few years earlier. Both, up to that time believed to be extinct, are now considered classical "living fossils." This exhibit permits a glimpse into the ancestral history of the dawn redwood and a comparison of its evolutionary progress during geologic time. Wherever feasible, herbarium specimens of living plants have been placed next to the fossil shale imprints, demonstrating the remarkable similarity of some fossil leaves, fruits, and seeds to their living equivalents. Fossil *Metasequoia* and its associated flora originate from the Oligocene Ruby assemblage in southwestern Montana and are here represented by exquisite imprints of mostly new species. The similarity between fossil and extant specimens of *Metasequoia* and some of the angiosperms displayed suggests the slowness of the evolutionary process in some plants, emphasizing their conservative development during the past twenty-five million years.

This unique display was arranged by Dr. Herman F. Becker, Visiting Research Associate of The New York Botanical Garden. Other members of the Garden's staff, including Dr. H. W. Rickett, Acting Assistant Director (Botany) and Miss Elizabeth Hall, Librarian, also aided in the preparation of the comprehensive educational exhibit on the redwoods.

It was set up by the Redwood Grove, the National Parks, the Conservation, and the Horticultural Committees of The Garden Club of America for The New York Botanical Garden. Many organizations and many individuals cooperated by furnishing plant materials, minerals, books, photographs, and prints.

The Save-the-Redwoods League sent plant material — ferns, cones, branches of shrubs and trees, and redwood products. The Redwood Association sent redwood products, living trees, and posters and other material to demonstrate reforestration and selective cutting.

Minerals from northern California came from Dr. Ian Campbell, Chief of the Department of Mines of the State of California, and minerals from southern California were provided by the U. S. Borax and Chemical Corporation. The California Academy of Science loaned mounted birds.

Included in the exhibit are mural photographs from the National Parks Service; large colored photographs of the National Parks from the National Geographic Society; photographs of reptiles, amphibians, and mammals loaned by the American Museum of Natural History and the New York Zoological Society, and of birds loaned by the National Audubon Society's office in Berkeley, California; also photographs of the high Sierras loaned by the Sierra Club of California.

Several artists have contributed their talents to enhance the exhibit. Miss Shirley Miller of the National Audubon Society created a diorama of the redwood forests. George Peterson of the American Museum of Natural History modeled a trunk of the famous General Sherman tree in Sequoia National Park. Marion Tatum of Palo Alto, California, prepared four serigraphs of the flora of the redwoods. John Cameron Yrizarry, a nature artist of Brooklyn, New York, painted murals of these big trees, *Sequoiadendron giganteum* and *Sequoia sempervirens*.

Books on the birds of California, loaned by the National Audubon Society, and books on the plants of the coastal regions and the Sierras, loaned by The New York Botanical Garden, augment this extensive exhibit which illustrates the importance not only of saving the redwoods themselves, but of protecting the plants, birds, animals and other organisms that make up the ecology of the redwoods. The exhibit which opened on January 15 will close on March 15.

Tribute to August C. Pfander. The Board of Managers of The New York Botanical Garden, at its meeting October 29, 1959, paid tribute to Mr. Pfander who retired on November 1, 1959, after twenty-seven years of loyal and efficient service to The New York Botanical Garden.

Mr. Pfander entered the service of the Garden in September 1932 as a construction foreman for the then newly started Thompson Memorial Rock Garden, upon the completion of which, in appreciation of his outstanding abilities, he was retained in the permanent employ of the Garden. Subsequently, Mr. Pfander advanced to the position of Assistant to the Superintendent, Superintendent of Buildings and Grounds, and finally to that of Administrator.

By reason of his position, he was in constant touch with the maintenance group of employees and was particularly effective in fostering their morale.

On October 23, 1959, the staff and other employees of the Garden tendered Mr. Pfander a farewell party and presented him with a suitably engraved gold watch.

National Science Foundation Grants to the Garden. The National Science Foundation awarded The New York Botanical Garden a grant of $46,900 for the support of basic research entitled "Investigation of Phylogenetic Relationships," under the direction of Dr. Alma W. Barksdale, Research Associate. The grant, which became effective December 22, 1959, will be three years in duration.

A. C. Pfander

The National Science Foundation awarded the Garden a grant of $12,600 for the support of basic research entitled "Proposals for Conservation of Botanical Names," under the direction of Dr. H. W. Rickett, Acting Assistant Director (Botany) and Bibliographer. The grant became effective in December 1959 and will last five years.

Membership. New members are being added to The New York Botanical Garden. Over 700 have been enrolled since the membership campaign was initiated.

You can assist in the Membership Drive by sending the names of prospective members to the Membership Secretary, The New York Botanical Garden.

Fund for Library Wing. Mrs. Hermann G. Place, Vice-President of The New York Botanical Garden and Chairman of the Building Committee, has announced that gifts for the proposed library wing, at the end of January 1960, totaled $148,000. The largest individual contribution is $31,020 for the reading room.

F. A. Bartlett medal, an award of the American Horticultural Council, made possible through the generosity of F. A. Bartlett, of Stamford, Conn. The first presentation was made to Bernard H. Slavin at the fourteenth American Horticultural Congress in Rochester, N. Y., October 1959.

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Gift to the Library. R. Gordon Wasson, Treasurer of The New York Botanical Garden, presented to the library the beautifully illustrated *Les Champignons Hallucinogènes de Mexique* by Roger Heim and R. Gordon Wasson.

Dr. William C. Steere. Director of The New York Botanical Garden, attended the meetings of the Biological Sciences Curriculum Study Committee of the American Institute of Biological Sciences, held in New Orleans, Louisiana, on January 28 and 29, 1960. Dr. Steere addressed an assembly of the members of the Redwood Grove, the National Parks, the Conservation, and the Horticultural Committees of the Garden Club of America and their guests on February 4th. The luncheon-meeting was held at the Garden in connection with the Redwoods Exhibit.

Dr. Steere will deliver an address at the annual meeting of the Fairchild Tropical Garden to be held in Miami, Florida, on March 24, 1960.

Dr. Steere has received a grant from the Arctic Institute of North America for support of a field study and evaluation of arctic mosses in northern Alaska during this coming summer.

Staff Activities. Dr. Bassett Maguire, Head Curator and Coordinator of Tropical Research, and Mrs. Maguire returned from their five months expedition to South America the last week in January.

Dr. Richard M. Klein, Alfred H. Caspary Curator, and Miss Georgia E. Manos presented a paper on "The Use of Metal Chelates for Plant Tissue Cultures" at a conference on chelation at the New York Academy of Sciences.

Dr. Arthur Cronquist, will direct the 1960 Summer Institute for high school students to be given at the Garden under a grant from the National Science Foundation.

Dr. Marjorie Anchel, Research Associate, attended a four weeks course in radioisotopes at the Oak Ridge Institute for Nuclear Studies.

Recognition of Dr. Pirone. Dr. P. P. Pirone, Plant Pathologist, was presented with an award certificate by the New York State Arborists Association in recognition of leadership, devoted service, and interest in the better appreciation of and the preservation of shade trees.

Appointment. The New York Botanical Garden has appointed H. Wilson Lloyd to assist in the Garden's public relations and promotional activities. Mr. Lloyd is head of his own public relations firm in New York.

Dr. J. J. Wurdack has tendered his resignation as associate curator of The New York Botanical Garden, effective February 1, 1960, to become an associate curator in the Department of Botany, Natural History Museum, Smithsonian Institute, Washington, D.C.

Outdoor Gardencraft. Registration started in the middle of January 1960 for this course in outdoor vegetable and flower gardening for a limited number of children between the ages of nine and sixteen. The course will open at The New York Botanical Garden on March 26, and will be given on Saturday mornings until school closes. Thereafter, instruction will be given on week-days by Mrs. Lillian Weber, Instructor, assisted by Miss Nancy Callaghan and John Dowling.

Pelargoniums on Display. The New York Botanical Garden has been adding to its pelargonium collection, and one hundred and fifty species, varieties, and hybrids were displayed in the Conservatory during January and February.

Hippeastrum procerum, the blue amaryllis, is a native of Brazil and grows in the crevices of steep granite cliffs in the Organ Mountains near Rio de Janeiro. A bulb of this rare plant, received at The New York Botanical Garden eleven years ago, was brought into flower on December 19, 1959, and remained in flower until January 9, 1960.

H. procerum was previously flowered at the Garden in 1941 and at that time remained in flower for almost three weeks.

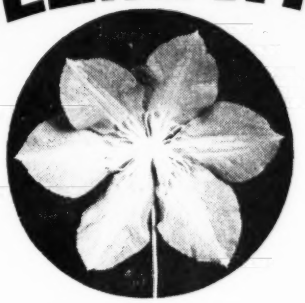
Until 1930 or so, one could count on his hand the number of times *H. procerum* had been flowered under cultivation, according to T. H. Everett, Assistant Director (Horticulture) and Curator of Education of The New York Botanical Garden. In more recent years, there have been more frequent reports of its flowering under cultivation.

Though *H. procerum* grows from seed in the wild, it is seldom that plants are raised from seed under cultivation. Louis P. Politi, Horticulturist of the Garden, succeeded in raising seedlings of the blue amaryllis this past winter.

Recent Visitors at the Garden. Within recent months, the following have visited The New York Botanical Garden:

Dr. Geneva Sayre, Russell Sage College, Troy, New York.

CLEMATIS



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Dr. Fred A. Barkley, Warner-Lambert Pharmaceutical Laboratories, Morristown, New Jersey.
Dr. Lewis E. Anderson, Dept. of Botany, Duke University, Durham, North Carolina.
Dr. Harold J. Humm, Dept. of Botany, Duke University, Durham, North Carolina.
Dr. Josiah T. Lowe, Syracuse University, Syracuse, New York.
Dr. Robert Gilbertson, Syracuse University, Syracuse, New York.
Dr. K. Lem, Goucher College, Baltimore, Maryland.
Miss Arlene C. Kane, National Parks Association, Washington, D.C.
Dr. Harrison Nelson, The Upjohn Company, Kalamazoo, Michigan.
Dr. Walter Sokolski, The Upjohn Company, Kalamazoo, Michigan.
Dr. Robert L. Shaffer, Dept. of Botany, University of Chicago, Chicago, Illinois.
Miss Teresa Salazer, Bogota, Columbia.

Torrey Botanical Club. Dr. Karl Maramorosch of Rockefeller Institute gave a talk on "Friendly Viruses" on December 15, 1959; Dr. Leonard H. Weinstein of Boyce Thompson Institute for Plant Research a talk on "The Basic Considerations in the Preservation of Cut Flowers" on January 5, 1960.

At the annual meeting of the Torrey Botanical Club on January 19, 1960, Dr. George L. McNew, Acting Director of Boyce Thompson Institute for Plant Research, spoke on "Administration—The Art of Living with Scientists."

On February 6, 1960, Prof. Robert L. Starkey of Rutgers University lectured on "The Microbial World and Plant Roots." On February 16, 1960, Dr. Herman F. Becker, Visiting Research Associate at The New York Botanical Garden, talked about his "Plant Fossil Expedition to Montana—New Species and By-Products."

On March 1, the members of the Torrey Botanical Club will hear a lecture by Dr. Paul Burkholder, Director of Research of the Brooklyn Botanic Garden, on "Biological Research in the Antarctic." This lecture will be given in Larkin Hall, Fordham University. On March 15, in Schermerhorn Hall, Columbia University, Prof. Philip Mayerson of New York University will address the club on "Desert Ecology: Flora and Ancient Agriculture in the Negeb."

Dr. Ralph R. Stewart, Director of Gordon College, Rawalpindi, West Pakistan, India, recently addressed a "Gordon College News Notes" to his friends at The New York Botanical Garden. He and Mrs. Stewart are due to sail for their terminal furlough on May 6, 1960, as he reaches his seventieth birthday in April.

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CHARLOTTE RUSSELL (E) CORAL PINK
Wide Petals, Ht. 3 ft., May, July
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3½" Wide, Ht. 2 ft., May, June, July
JOE HOUSE (Semi-E) LAVENDER PINK
6" Wide, Ht. 3½ ft., May, June
LAURA RUSSELL (E) GOLD
4½" Bloom, Ht. 2 ft., May, June,
MRS. C. C. HUFF (D) PURPLE
5" Bloom, Ht. 3 ft., May, June
MURRAY RUSSELL (D) RED
Profuse Bloomer, Ht., 2½ ft., April, May
NANETTE RUSSELL (E) YELLOW
7" Bloom, Ht. 2½ ft., April, May,
PINK ALLURE (D) PINK
3" Bloom, Ht. 2½ ft., June, July
PRIDE OF JUNE (D) RED
5" Bloom, Ht. 3 ft., June, July
RED FURY (D) RED
Small Red, Blooms Profusely, Ht. 3 ft., April, May, July, August

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The U. P. Commission, which supports Gordon College and Forman College in Lahore, with many more in other parts of the world, expects that its staff on furlough will engage in a certain amount of speaking. So Dr. Stewart plans to give some lectures. Then, if he continues to enjoy good health, he will spend about a year in Great Britain working on botanical problems which he has not been able to complete because of the many demands on his time.

Dr. Daskawie, who spent an interesting furlough in the United States, returned to Rawalpindi in September 1959 to assume the principalship of Gordon College.

Rev. H. R. Fuger of Allahabad, who was living in Gordon Hall when Dr. Stewart arrived there in 1911, retired last September after forty-nine years of service. Dr. Milford Barnes and Dr. H. J. Stewart, who went to Gordon College in 1905, are retired and living in the United States. Dr. S. C. Picken, who preceded Dr. Stewart in the Biology Department, and Prof. W. L. Porter, who started some of the science classes before leaving in 1907, are also living. And Dr. Stewart recently heard from his cousin, Prof. C. A. Stewart, who arrived in Rawalpindi in 1913, and from Prof. W. H. Merriam, who, he believes, arrived in 1907.

It can be understood why Dr. Stewart ends his interesting letter with—"If you want to live long, come and teach in India and Pakistan."

Dr. Henry Andrews, Dean of the School of Botany, Washington University, will leave in May 1960 for the University of Poona, India, as he has been granted a Fulbright teaching fellowship for a year's study there. Dr. Andrews will teach a course in palaeobotany.

He will return to St. Louis by way of Jimma, Ethiopa, where he will inspect an agricultural research program directed by Hugh Rouk, a graduate student completing requirements for his doctorate from Washington University. The program is sponsored by the University of Oklahoma.

Wilhelm Ruhland, formerly Director of the Botanic Garden and Institute at Leipzig, Germany, died at Wurttsburg in January 1960 (date not specified) at the age of eighty-two. He was editor of *Handbuch der Pflanzenphysiologie.*

Burpee's Introductions for 1960. Seventeen annuals are being introduced this spring by W. Atlee Burpee Co. of Philadelphia; among them are three All-America bronze medal winners. These are 'Toreador', an F_1 hybrid American marigold, mid-orange in color; 'Glamour', a tetraploid annual phlox in mid-salmon; and 'Vanguard', a hybrid double snapdragon with tapered spikes of cerise-rose flowers.

Burpee considers one of its introductions, Gloriosa Golden Daisy, to be one of the outstanding flowers for 1960. The original gloriosa daisies were developed from black-eyed susans by Dr. A. F. Blakeslee of the Carnegie Institute of Washington at Cold Spring Harbor, New York, and of Smith College, Northampton, Massachusetts. Over a period of forty years, Dr. Blakeslee selected and hybridized the best he could find of this native flower. He then created tetraploids for greater size and vigor.

All-America Mum Selections for 1960. Chrysanthemum breeders are developing early flowering garden mums that also meet the demand for long-lasting quality as cut flowers. These mums bloom well in Minnesota and the Northwest or New England and southern Canada before normal winter freezes set in. Other new varieties are medium-early, that is, they start to flower in October and continue to do so until killing frost. Except in extreme northern localities, these new mums have a long-blooming season without protection.

1960 All-America Mum Selections are 'Mardi Gras', a fully double, large-flowered, red and yellow; 'Headliner', described as having four-inch walnut-coral flowers; and 'Pink Cherub', a purplish pink pompon.

A New Strawberry. 'Sonjana', a climbing strawberry, was developed by Reinhold Hummel, a West German nurseryman, and named after his daughter Sonja. It is being introduced in this country by Wm. Penn Nursery Co., West Grove, Pennsylvania (a subsidiary of The Conard-Pyle Co.) under Plant Patent No. 1691.

When this plant was exhibited at the horticultural show in Stuttgart, Germany, people were amazed to see that it had been trained in festoons covering an archway and in the shape of wreaths. 'Sonjana' is both an ornamental plant as well as the producer of middle-size, firm, and meaty berries. Because of the weight of the berries, the vine has to be tied at intervals to its support—a trellis or pole, or wire netting. It can also be grown in large tubs or jars on the terrace or patio—with the runners trained upward to a trellis or allowed to drape over a wall. As sunlight and air all around the plant are essential, it is advisable not to train this climbing strawberry against a solid wall.

American Dahlia Society. At the annual meeting held in New York City on January 16, 1960, Bertram E. Pitt of Richmond Hill, New York, was elected president; Edward B. Lloyd of Montclair, New Jersey, re-elected secretary; Mrs. Caroline Meyer of Bergenfield, New Jersey, re-elected assistant secretary; and Harry A. Dreyer of Ridgewood, New Jersey, re-elected treasurer.

The financing of a research program on dahlia diseases was referred to the Executive Board for further consideration.

The annual exhibition, in cooperation with the Dahlia Society of New Jersey, will be held in the Civic Auditorium of the Garden State Plaza, Paramus, New Jersey, September 21 and 22, 1960.

The proposal to cooperate with the National Association of Gardeners in September on the occasion of that organization's fiftieth anniversary in Asbury Park, New Jersey, received favorable consideration.

The fiftieth annual exhibition of the American Dahlia Society will be held in 1964, with Secretary Lloyd heading the exhibition committee to cooperate and coordinate the Society's plans with those of the 1964 World's Fair Corporation.

Horticultural Society of New York Awards. At the annual meeting of the Horticultural Society of New York, held on January 20, 1960, Kingwood Center of Mansfield, Ohio, received the Society's distinguished service award "for outstanding contribution to the advancement of horticulture by an institution." In the presentation, Dr. Albert J. Irving, Chairman of Awards, pointed out the international commendation which has been won by Kingwood Center for cultural education and research, since its organization in 1953 under the will of the late Charles K. King, and to its phenomenal development of its service program under the direction of Dr. Raymond C. Allen.

The special award to "a professional horticulturist for outstanding accomplishments and contributions" was presented to Dr. Donald Wyman, Horticulturist of the Arnold Arboretum since 1936. He is lecturer, consultant, and author of many articles and books, two of which brought him the Norman Jay Coleman Award of 1949 and 1951.

The Society's award to an amateur for outstanding contribution to horticulture was presented to Mrs. Charles Doscher. She has served as president of the Federated Garden Clubs of New York State, Inc., as director of five other important organizations, and as director and chairman of the Horticultural Society of New York's lecture committee, and has been largely responsible for the increased attendance at lectures.

National Flower Election results were announced the last week in January, 1960. The rose garnered 386,841 of the 1,055,129 votes cast in the election conducted by the Florists' Telegraph Delivery Association. This was more than twice the total number of votes of its nearest competitor, the carnation. In third place was the chrysanthemum; in fourth place, the lily-of-the-valley.

The returns have been sent to Senator Joseph C. O'Mahoney (D. Wyo.), Chairman of the Senate Judiciary Subcommittee on Federal Charters, Holidays and Celebrations, and to Congressman Omar Burleson (D. Tex.), Chairman of the House Committee on Administration.

Forty-three nations list national flowers. Among major nations, only the United States and Soviet Russia have not proclaimed an official flower.

For more than forty years, the selection of an official flower has been discussed in Congress. During the last session, fifteen different bills, nominating various flowers, were introduced. If Congress should decide to select the rose as the official flower of the United States, it will become the fifth country to do so. The rose is the national flower of England, Iran, Honduras, and Luxembourg.

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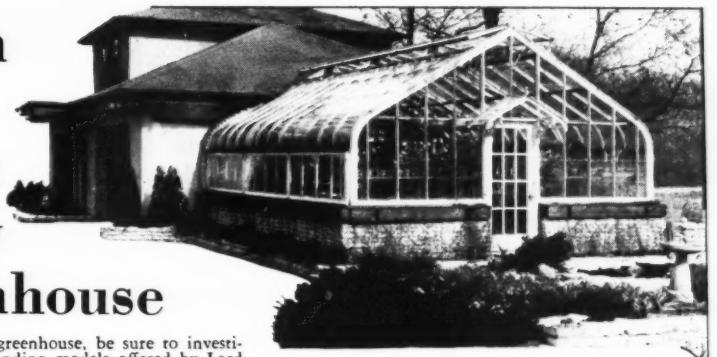

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BOOK REVIEWS (from page 76)

preferences, so the mistake cannot be made of putting plants together that are not-compatible. Lists are also given for special bloom and holiday use.

The technical aspects such as plant requirements, care, and propagation are covered concisely with diagrams showing different methods. Water gardening is also explained.

A "dictionary' of over one hundred house plants gives the popular and botanical names, ultimate size, care hints, soil and water requirements, and method of propagation.

Growing bulbs indoors for bloom and inexpensive methods of growing plants under artificial light open new fields even for the experienced. Hints on how to decorate the terrace with potted plants are interesting.

The book is easily read, well illustrated and should be on every indoor gardener's bookshelf.

MARY F. JOHNSON
Pompton Lakes, New Jersey

POPULAR STYLES OF JAPANESE FLOWER ARRANGEMENT. Lida Webb. 124 pages, illustrated, indexed. Hearthside Press, Inc., New York. 1959. $2.95

This is truly a needed guide and will be welcomed by the beginner as well as the advanced arranger.

The capsule approach is a most interesting representation of many phases of Japanese flower arranging, and one will benefit greatly by the schools, well known to us, that are demonstrated in this book.

All the necessary information is given, including numerous illustrations emphasizing the basic forms, placements and controls.

The author went all out to include in this book a suggested scale of points for "Judging Arrangements in the Japanese Manner."

The style of each individual school is easy to follow and will be of inspiration in creating beautiful flower arrangements.

HERTHA A. BENJAMIN
New York, N. Y.

THEY EXPLORED! Rhode Hoff and Helmut de Terra. 120 pages, illustrated. Henry Z. Walck, Inc., New York. 1959. $3.25

This is a collection of vest pocket summaries of facts of great explorers. The epic of their accomplishment loses some of its factual picture through condensation. To the mind of a ten- to fourteen-year-old, vastly stimulating avenues of adventure and learning are opened. The text is at its best when it quotes from the notebooks of the explorers, Humboldt, Livingston, Fremont, Hedin, Scott, and Herzog. They color the content with their heroic personalities.

The vital transformation of the impossible to the improbable to reality, as the struggles and obstacles are enfolded and overcome by these great men, contains the message of inspiration the book holds for the youngsters.

The explorations described occur from 1769 to 1950. The account of the feat of Herzog in 1950 lends a contemporary feeling to the book which is important to a child. This feeling has been captured and the conclusion has been conveyed that, "this could happen to me."

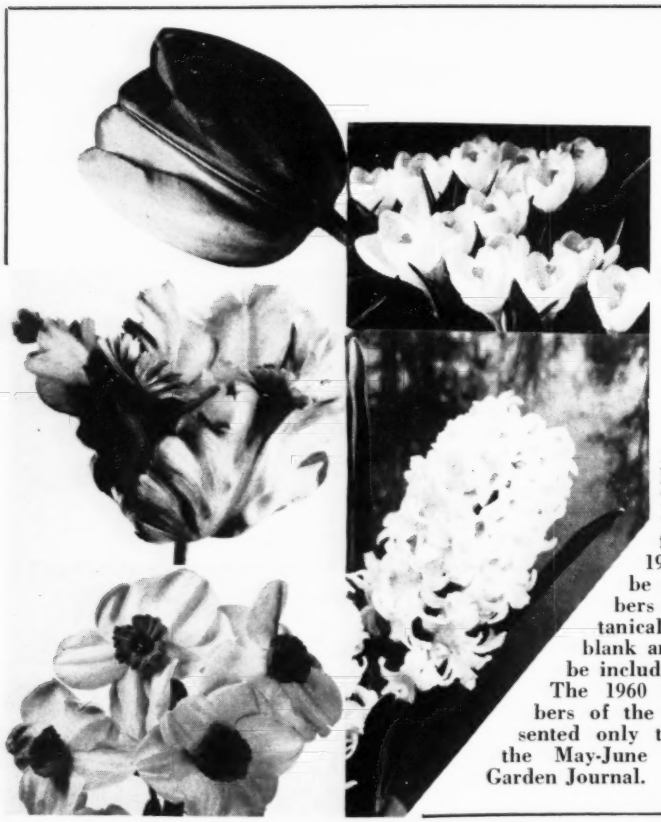
MRS. SAM LASKER
Scarsdale, N. Y.

WILD FOLK AT THE SEASHORE. Carroll Lane Fenton. 128 pages, illustrated, indexed. The John Day Company, Inc., New York. 1959. $3.50.

Here is a charming addition to the long list of Carroll Lane Fenton's other outstanding books on Nature. This time he has set the scene of his dramatic story at the ocean and has supplied an impressive cast of characters.

To make his descriptions attractive to children, the animals are given names: Larus the Sea Gull, Terri the Starfish, Mother Moon Snail, Big Claw the Lobster, and a whole clan of Crabs. There are others too, all of whom go through adventures and dangers that can occur only near, over or in the ocean.

This is, of course, a book designed for children. It is told with an awareness of what will appeal to the child's sense of excitement. But, except for the device of giving human names to the animal characters, the author emphatically does *not* talk down to his young audience. In every respect, this is an authoritative work. No naturalist would quibble as to the authenticity of the information in the book. And



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BULB OFFER
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•

A special insert in the May-June 1960 issue of *The Garden Journal* will describe the bulbs from Holland for fall 1960 planting that will be offered only to members of The New York Botanical Garden. An order blank and shipping label will be included in the insert. . . . . The 1960 Bulb Offer to members of the Garden will be presented only through the pages of the May-June 1960 issue of The Garden Journal.

the line drawings, appearing on nearly every page, serve beautifully to identify and distinguish the various species discussed in the text.

The children should love it. So did I.

SYLVIA STEIN
New York, N. Y.

CELL, ORGANISM AND MILIEU. Dorothea Rudnick (Edited by). 326 pages, illustrated, indexed. The Ronald Press, New York. 1959. $8.00.

Each summer, for the past seventeen years, a relatively small number of botanists and zoologists have met on a university campus to discuss some of the amazing and exciting processes by which cells and organisms grow and change. The pace of the sessions is leisurely, laughter and some excellent meals punctuate the scientific parts of the program and, withall, they are among the most rewarding and stimulating symposia held in any year. Each day, members of the Society or invited guests present detailed reports on their own research activities with emphasis on the relation of the specific topic to general biological thought. Following the formal presentation, each paper is carefully discussed by the group from many points of view. Ideas are freely exchanged; "Did you do thus and so?" "What would happen if. . . .?" "What is the relation of this to. . . .?" "Does this check with the results of. . . .?" No participant could possibly leave the symposium without more ideas than he could use in two lifetimes.

The Society for the Study of Development and Growth, recognizing the importance of their symposia has, each year, published the papers given at the meetings. Each volume contains major laboratory and "thinking" research papers on the frontier of biological endeavor. Not infrequently, a paper becomes the point of departure for an entirely new line of research. Although written by specialists, the viewpoint is deliberately of sufficient breadth that virtually any biologist will find himself enthralled by topics remote from his own primary interest.

The theme of the present volume, "Differentiation and growth in response to a changing chemical environment" is exemplified by topics seemingly as far apart as the growth of roots and insect growth hormones. As the reader will discover with pleasure, these subjects are very close together.

RICHARD M. KLEIN

INTRODUCTION TO HISTORICAL GEOLOGY. Raymond C. Moore. Second edition. 656 pages, illustrated, indexed. McGraw-Hill Book Company, Inc., New York. 1958. $7.95.

Geology texts are a matter of choice in college or university departments, and the first edition of this book was widely used throughout the United States. The present volume is considerably expanded and brought up to date by inclusion of new information in geology and palaeonecology accrued during the past decade.

Following the traditional presentation of historical geology, the material is, as expected, ably presented by this eminent author. In classical sequence, the "principles of historical geology" are followed by the evolution of life, including Man, the eras from the beginning of the Earth to Pleistocene glaciation, and interspersed by chapters on the nature and evolution of life for the respective systems. The Cenozoic, or youngest era, for which exists more geologic and fossil information than for any earlier span of time, is divided into two newly created systems, the Paleogene and the Neogene. The former comprises the more tropical Paleocene, Eocene, and Oligocene epochs with its ancestral mammalian and plant life, while the Neogene of Miocene, Pliocene, and Pleistocene age deals with aspects of modern plant and animal life under more temperate conditions.

Numerous charts, figures, and maps provide excellent basic knowledge for the student as well as the layman. The book is profusely illustrated with diagrams, drawings, and photographs (some full page), many of which are reproductions of the famous geologic landscape restorations by C. R. Knight.

An excellent appendix on "characters of organisms represented among fossils" (including plants) and a voluminous glossary make this book one of the foremost texts in its field.

HERMAN F. BECKER

PLANT LIFE. Lorus J. Milne & Margery Milne. 283 pages, illustrated, indexed. Prentice-Hall, Inc., Englewood Cliffs, New Jersey. 1959. $6.95.

Many friends of the gifted authors of this book will be glad that they have divided the material treated in *The Biotic World* and *Man* into two independent reviews. *Plant Life* is an interesting and well-organized book. While presenting the facts of elementary botany, it is refreshingly different from the usual text. It offers a partial solution to the problem of planning a course suitable not only for the future botany or biology major but for the non-science major as well.

Less than twenty pages on the kinds and values of plants arouse interest in microorganisms as well as in higher forms. Before further details are given, protoplasm, cells, and exchange with the environment are discussed. The chapter "Energy Relations of Life" includes a figure showing "the salient features of a 1958-model understanding of photosynthesis" and some discussion of enzymes and vitamins. The chapter on heredity includes two pages on the nature of the gene. There is a great deal of information in the book, concisely and skillfully presented. The student is made aware of the role of plants in nature and their significance in his own life; of recent advances in plant science and current problems in the field. Though technical terms are cut to a minimum, derivations are consistently given. As in the earlier book, the authors have included a wealth of excellent illustrations, most of them made by themselves.

One would like to say that no inaccuracies were noted. In a book of this caliber, one is surprised to read that, in the order Cordaitales, "cycad-like seeds were borne along the frond margins"; that a banana plant "peels off one broad petal for each hand of future bananas"; to find the magnificent staminate cone of *Cycas revoluta* in photograph 162 labeled ovulate.

Such small points will doubtless be corrected in the next edition, for this is a valuable and useful book which fills a need and could attract new talent to the ranks of botanists.

JENNIE L. S. SIMPSON
Hunter College
New York, N.Y.

BLAKESLEE: THE GENUS DATURA. Amos G. Avery, Sophie Satina, Jacob Rietsema. 289 pages, illustrated, indexed. The Ronald Press Company, New York. 1959. $8.75.

All geneticists and cytologists will appreciate a book of this type in which data from the 228 papers published in various periodicals by Dr. A. F. Blakeslee and his associates have been assembled and critically reviewed and evaluated. The volume is illustrated with 67 figures and contains 34 tables. The well-organized text is clear and concise. In a "Foreword," Dr. Edmund W.

Sinnott pays tribute to Dr. Blakeslee and describes this work as the "scientific biography of a notable man of science."

Following a historical review of the datura program, the taxonomy of the genus is presented. The chemistry, pharmacology, distribution, and biogenesis of the alkaloids of datura are treated in Chapter 3 by Edward Leete. The next six chapters are devoted to cytological investigations on chromosome number and morphology, polyploidy, extra chromosomal types, gene mutations, chimeras, and radiation effects. The last six chapters are concerned with sterility studies approached from morphological, physiological, and cytological directions. A fifteen-page index makes all information readily available to the reader.

No more fitting tribute could be made to Dr. Albert Francis Blakeslee than this volume on *Datura* which has been written by his co-workers. It is a job well done.

CLYDE CHANDLER
Boyce Thompson Institute for Plant Research, Inc.
Yonkers, New York

DEVELOPMENTAL CYTOLOGY. Dorothea Rudnick (Edited by). 215 pages, illustrated, indexed. The Ronald Press Company, New York. 1959. $7.00.

This volume contains nine contributions to the Sixteenth Symposium of the Society for the Study of Development and Growth held at Kingston, Rhode Island, in 1957. Cytological features of development are discussed in a wide variety of organisms ranging from the protozoa through plants to the higher mammals and man.

Modern viewpoints on chromosome and cytoplasmic structures are presented and much of this information is the result of research utilizing the latest techniques of cytology and cytochemistry.

The nine authors, J. R. Preer, C. R. Partanen, T. C. Hsu, G. and E. Klein, W. Beermann, H. F. Stich, D. von Wettstein, D. W. Fawcett, and A. L. Lehninger are authorities in their respective fields, and their articles contain, in addition to the results of their own research, competent and valuable reviews of the topics discussed.

This book will be of interest to all interested in the fundamental problems of biology.

CHARLES A. BERGER
Fordham University
New York, New York

101 BEST NATURE GAMES AND PROJECTS. Lillian and Godfrey Frankel. 128 pages, illustrated and indexed. Sterling Publishing Co., Inc., New York. 1959. $2.50.

This is a good book pal for Cub Scout or Brownie leaders. The projects are well defined and illustrated. The materials needed are not expensive and fairly easy to obtain. The text is written on a level easy for children to understand and assimilate without too much explanation.

Its content is very stimulating and invites the youngsters to pursue further on their own a particularly interesting subject.

The collection of games includes physical as well as mental exercises to hold the interest of a lively group of youngsters.

I recommend this book for garden club junior work, church groups, Cub Scouts and Brownies, particularly in the seven to eleven age groups. Some of the handcraft instructions are sketchy and should be worked out ahead of time by the leader.

MRS. SAM LASKER
Scarsdale, N. Y.

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A REVIEW (from page 58)

are likely to promote an even balance and damp down the explosive power of outbreaks and new invasions." To obtain this fundamental knowledge of the functioning and stability of natural communities, we must study intensively our remaining wild areas, areas that have been termed "living museums of natural history" because of the wealth of forms and facts they contain.

The collection of examples and case histories of invasions to document and substantiate the conclusions made in this book has entailed considerable effort. Although the histories of animal invasions far outnumber those of plant invasions, plants have not been neglected. Prickly pear, ragwort, St. John's wort, rhododendrons, *Elodea*, diatoms, algae, and various other plants are considered. But one cannot help wonder why such a well-documented case as the spread of Russian thistle has been ignored, or why some of the stories of such ubiquitous weeds as the dandelion, common and English plantain, ox-eye daisy, chicory, lamb's quarters, purslane, chickweed, shepherd's purse, yarrow, mustard, and many others were not included. Among the insect invaders of North America, it is surprising to find no mention of the honey bee, Oriental roach, and other widely distributed forms. Each of these would have further strengthened the case presented by Dr. Elton and might have illustrated some of his points more vividly than the cases that were actually cited.

LETTERS TO THE EDITOR

I just have to tell you how very fine *The Garden Journal* is — the last issue was "tops" . . . The articles are so informative and such enjoyable reading. And I'm not the only one who thinks so, for each of the good gardeners to whom I give *The Garden Journal* have told me they look forward eagerly for the magazine.

. . . Thank you for being messenger to the Subscription Department, giving it the renewals which accompany this letter.

ELSA FORT
Merchantville, New Jersey

Your excellent magazine, November-December 1959, has just arrived. In Dr. Pirone's article on "Why Shade Trees Die Along City Streets," he shows examples of fungi which are apparently identical with those killing trees in my garden here. As these trees are several centuries old holly oaks (*Quercus ilex*), we are much perturbed and would like to hear what cure can be achieved.

The particular items disturbing us are apparently *Ganoderma lucidum* of which we had recently two magnificent effulgent examples, and on removing as much affected tissue as we could, we found what must be *Armillaria mellea* by the white wefts of tissue near the soil line. A third tree has a tiny white toadstool about one eighth inch diameter near the soil on the north side of the tree after a heavy recent rain.

This excellent article describes the disease, but not the cure. Is there any soil sterilizer we can use? . . . .

I shall be grateful for any information.

F. GORDON MORRILL
Florence, Italy

Dr. Pirone replied as follows:

Unfortunately cure is not possible for any of these, once the infection has become extensive. That is the reason why a cure was not mentioned in my article.

Insofar as the shoe string rot fungus, *Armillaria mellea*, is concerned, the Connecticut Agricultural Station, New Haven 4, Conn., says that soil can be disinfested of this fungus by drenching with one half pint of phenyl mercury acetate in one hundred gallons of water. From thirty to sixty days are required for the chemical to kill the fungus in the soil and in the diseased roots. Bear in mind, however, that this treatment cannot be used on living infected trees.

Bravo to "Country Housewife," Mrs. Foster, for her comments on some unfortunate nursery practices. I'd like to carry her ball a little further.

It is not unusual to see quite common plants advertised as "new" and "rare." *Albizzia julibrissin* and *Crossandra undulaeformis* are two subjects that have been so advertised during the past few years. The former is prolific nearly unto weediness in areas where it is hardy, and crossandra, according to Bailey's *Cyclopedia of Horticulture*, was described a century or more ago in *Curtis' Botanical Magazine* and the *Botanical Register*, and in *Revue Horticole* in 1891.

In 1954 I succumbed to a full-page color blurb of a Long Island outfit for a rare exotic, just discovered in China and now introduced for the first time. The subject proved to be lythrum 'Morden Pink,' so precious that it is listed as available at ten nurseries in the *Plant Buyer's Guide* (1949). The three "large" plants that I received for $2.98 were unrooted cuttings, and two were dead. I managed to root and later plant out the remaining one, and it stands in my garden as a reminder of caveat emptor.

I wrote a critical letter to the nursery and told them I was sending a copy to the newspaper. By return mail I received (a) a cheque from the nursery and (b) a letter from the paper registering dismay and vowing that it would never publish the advertisement of these horrendous rascals again. But there was a funny thing about both replies. In the case of (a) the amount of $2.98 was printed, not typed or put on with a check-writer, but printed on the cheque. Clearly, the refunding of exactly $2.98 was no new experience for this outfit. In the case of (b) the following year, and every year since, the same advertisement or one very much like it has been carried. One hopes the Long Island nursery has stocked up on a plentiful supply of pre-printed cheques.

Another thing that bothers me is the tender pampering of professional growers by state and federal government agencies. In 1952 I brought home from Guatemala and submitted to quarantine a number of cuttings, including one of a very large dianthus that I had found in a hotel garden. Soon a Department of Agriculture inspector came to my greenhouse and removed two cuttings. One was a passiflora, which could harbor a harmful insect, and the other was the dianthus. Had I insisted, he would have let me keep the former under conditions of periodic inspection, but he insisted on destroying the dianthus. Why? Because it was bigger than any other in this country and presented a threat to U. S. nurserymen! Apparently, protecting professional growers from competition is more vital than the possibility of a plague.

Every spring growers of very expensive pot-plants come to my fullsome but amateur greenhouse and depart with gifts of plants and cuttings, often new to the growers. They put in their pockets scribbled lists of things I'd like to have in exchange, and murmur promises. That's usually the end, until the following spring when back they come with the robins and as empty-handed. To be fair, there are exceptions—but they are exceptions. Having spent $30 for plants at a nearby greenhouse, I begged a tip-cutting of *Setcreasea purpurea*, Mr. Everett's colorful introduction. (I had given the man his start of the plant the previous year.) The favor was graciously granted, but another dollar added to my bill. Clearly, "payola" has not come to the petunia patch!

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